



Alternate Boost Vehicle (ABV) Verification Tests



Environmental Assessment

14 August 2002

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**DEPARTMENT OF DEFENSE
MISSILE DEFENSE AGENCY
GROUND-BASED MIDCOURSE DEFENSE
JOINT PROGRAM OFFICE**

P.O. Box 1500
Huntsville, AL 35807-3801

GMW

August 9, 2002

SUBJECT: Alternate Boost Vehicle (ABV) Verification Tests Environmental Assessment

Please find the Alternate Boost Vehicle (ABV) Verification Tests Environmental Assessment and its associated Draft Finding of No Significant Impact enclosed for your use and information.

Questions regarding this document or requests for additional copies should be addressed to: Deputy Commander, U.S. Army Space and Missile Defense Command, ATTN: SMDC-EN-V-N, P.O. Box 1500, Huntsville, AL 35807-3801.

Sincerely,

A handwritten signature in cursive script, appearing to read "Steve Davis", is written over a large, stylized, handwritten "S" that serves as a signature flourish.

STEVE DAVIS
Colonel, U.S. Army
Director, Site Activation World Wide
Ground-Based Midcourse Defense

Enclosure:
As stated

ALTERNATE BOOST VEHICLE (ABV) VERIFICATION TESTS ENVIRONMENTAL ASSESSMENT

AGENCY: Missile Defense Agency (MDA)

ACTION: Finding of No Significant Impact

BACKGROUND: MDA has conducted an Environmental Assessment (EA) of the potential environmental consequences of the development and test of an uncanisterized Alternate Boost Vehicle (ABV). Up to six ABV test flights over about a 5-year period are proposed at Vandenberg Air Force Base (AFB), CA. This EA has been prepared in accordance with the National Environmental Policy Act of 1969, as amended, and its implementing regulations, 42 U.S. Code 4321 *et seq* and 40 Code of Federal Regulations (CFR) 1500-1508, respectively; 32 CFR Part 651 (Army Regulation 200-2), *Environmental Effects of Army Actions*; 32 CFR 989 (Air Force Instruction 32-7061), *Environmental Impact Analysis Process*; Department of Defense Instruction 4715.9, *Environmental Planning and Analysis*; and Executive Order 12114, *Environmental Effects Abroad of Major Federal Actions*. The purpose of the Proposed Action is to confirm the ABV and silo designs, demonstrate silo egress, test the booster under operationally representative conditions, demonstrate vehicle maneuverability (control limits, vehicle response), demonstrate representative aero-thermal loads and guidance algorithms, and conduct stressing maneuvers through a test flight of the ABV.

DESCRIPTION OF THE PROPOSED ACTION: MDA is developing the Ground-Based Midcourse Defense (GMD) Element of the conceptual Ballistic Missile Defense System (BMDS). The BMDS concept is to defend against threat missiles in each phase or segment of the missile's flight. There are three segments of this conceptual system in various stages of technology development: Boost Phase Defense, Midcourse Defense, and Terminal Defense. Each segment of the BMDS is being developed to destroy an attacking missile in the corresponding boost, midcourse, or terminal phase of its flight. The boost phase is the portion of a missile's flight in which it is producing thrust to gain altitude and acceleration. During the midcourse phase, which occurs outside the earth's atmosphere for medium and long-range missiles, the missile is coasting in a ballistic trajectory. During the Terminal Phase, the missile enters the atmosphere and continues on to its target. The GMD Element is designed to protect the United States in the event of a limited ballistic missile attack by destroying the threat missile in the midcourse phase of its flight.

In 1999, the potential environmental impacts of the activities associated with two canisterized Ground-Based Interceptor (GBI) booster verification test flights from Vandenberg AFB were analyzed in the *Booster Verification Tests Environmental Assessment*. Development of the current GBI boost vehicle has been more challenging than originally anticipated. Congressional direction in the Defense Authorization Act for

fiscal year 2001 included the development of a backup booster option involving proven technologies. A decision was made to develop and test a second boost vehicle, the uncanisterized ABV. These proposed ABV test flights are an important step in the development of the GMD Element.

Building 1555 or 1819 on Vandenberg AFB would be used for integration and checkout of the ABV flight vehicle when it arrives at the base. The ABV test Launch Control Center and the Communication Center would be located approximately 1.5 kilometers (0.9 mile) northeast of LF-23 in Buildings 1978 and 1959, respectively. Building 1959 may serve as a back-up Launch Control Center. The ABV tests would be conducted from a modified Minuteman II silo at LF-23 (Building 1963).

Minor modifications and site preparation would be required at the LF-23 launch site. The proposed launch site would include the launch silo, the silo interface vault equipment located within the existing Minuteman launch equipment room, the existing silo access roadways, site utility distribution, and any auxiliary mechanical support equipment or junction boxes required to support the launch operation. Site preparation would include relocation of an existing re-radiating tower with antennas and modifying the existing silo at LF-23 to receive a prefabricated launch station that would accommodate installation of the ABV. Other modifications would include preparation of the existing launch equipment room for installation of silo interface vault equipment. A headworks (a foundation and silo top block) would provide tie-down points or other interfaces for insertion and removal of the ABV. A non-mechanical launch silo environmental cover, which would protect the silo from the elements, would be installed and removed with a crane or similar equipment.

The ABV would consist of a commercially available, solid propellant booster consisting of three stages and an exoatmospheric kill vehicle emulator that may contain a divert and attitude control system. No intercepts of the boosters are planned as part of these ABV tests. The three-stage missile would contain less hydroxyl-terminated polybutadiene solid rocket fuel propellant (no more than 30,400 kilograms [67,000 pounds]) than contained in the Minuteman III previously flown in this area.

During the proposed flight tests, the ABV would travel westward over the Pacific Ocean, approximately 6,500 kilometers (4,040 miles), to a proposed termination point north of the Ronald Reagan Ballistic Missile Test Site (RTS), U.S. Army Kwajalein Atoll.

ALTERNATIVES TO THE PROPOSED ACTION:

No-action

Under the No-action Alternative, MDA would not proceed with the ABV development and testing. Vandenberg AFB would continue to launch missiles as analyzed in prior environmental documents.

Alternative Action

Two alternative locations were considered for the ABV launches: RTS and Cape Canaveral, Florida. No silos exist at Cape Canaveral and only uncompleted silos exist at RTS. New construction for an entire launch complex would cost up to twice the amount of reconfiguring LF-23 and would take up to three times as long. This alternative would not meet mission schedule requirements and would result in unreasonable delay to the testing program and the ability to provide a contingency defense. While a launch silo capability at RTS could be completed in time to perform the testing, that testing would adversely affect other ongoing testing from Meck Island. Additionally, performing the required trajectories from Meck would require performing significant dog-leg maneuvers which are: (1) not very representative for the booster and (2) more difficult for the booster to perform, so it adds unnecessary risk to the booster flights.

Three additional alternative LFs were initially evaluated as potential launch sites for the ABV tests: LF-25, LF-24, and LF-07. These sites were eliminated from further study because of physical and environmental constraints. In addition, LF-21 was eliminated because the silo configuration is for a canisterized missile and the proposed ABV configuration is for a non-canisterized missile.

ENVIRONMENTAL EFFECTS:

Proposed Action

To provide a context for understanding the potential effects of the Proposed Action and a basis for assessing the significance of potential impacts, several environmental resource areas were evaluated. The resource areas determined to have a potential for impacts were air quality, biological resources, cultural resources, environmental justice, geology and soils, hazardous materials and waste, health and safety, infrastructure, land use, noise, and water resources. Each environmental resource was evaluated according to a list of activities that were determined to be necessary to accomplish the Proposed Action.

Implementation of the Proposed Action would result in negligible impacts to the resource areas listed above on Vandenberg AFB. All activities would be in compliance with applicable federal, state, and local regulations and requirements.

Air Quality. No exceedance of air quality standards or health-based standards of non-criteria pollutants are anticipated from facility modifications and site preparation activities necessary for the ABV tests. Missile launches are short-term, discrete events, thus allowing time between launches for emissions to be dispersed. Blast residue (propellant byproducts, paint burned from the silo, and umbilical cables) released during launch activities would be contained in the silo. Emissions from launch preparation and launch activities would be regulated in accordance with the agreement between Vandenberg AFB and the Santa Barbara County Air Pollution Control District for Vandenberg AFB and are not anticipated to cause exceedances of air quality standards.

Review of the Proposed Action as required by the General Conformity Rule resulted in a finding of presumed conformity with the State Implementation Plan.

Biological Resources. Site preparation, pre-launch, or launch activities would not have significant adverse impacts to vegetation, wildlife, threatened/endangered species, or wetlands. There would be little to no ground disturbance and resultant impact to vegetation from modification activities. All transportation of equipment and materials would be conducted in accordance with applicable spill prevention, containment, and control measure regulations, which would preclude impacts to biological resources.

Nominal launch activities during dry conditions could result in the deposition of very small amounts (pounds) of nontoxic aluminum oxide from missile exhaust. Rain within 2 hours of launch could cause hydrogen chloride to be deposited in small quantities, which when emitted during solid propellant missile launches for very large flight vehicles (such as the space shuttle), is known to injure plant leaves and affect wildlife. However, the potential impact on vegetation and wildlife from the proposed launch of the smaller ABV is expected to be slight. Proposed activities are not expected to impact water bodies that could potentially contain the endangered tidewater goby and unarmored threespine stickleback, or the threatened California red-legged frog.

Although the noise level for the ABV is expected to be within the range, or less, of prior Minuteman launches and relatively short in duration, noise monitoring would be performed during the initial launch of an ABV. Harbor seal monitoring would be conducted during the pupping season (March through June) in accordance with Vandenberg AFB guidelines. The U.S. Air Force, 30th Space Wing has requested that ABV launches be included along with previously approved Peacekeeper and Minuteman launches in the 10 (total) intercontinental ballistic missile launches allowed under their 5-year programmatic permit and Letter of Authorization with the National Marine Fisheries Service. No expansion of the 10 launch (total) limit is desired or requested. The program will not proceed with launches until coordination with the National Marine Fisheries Service is complete. The 30th Space Wing has determined that Endangered Species Act Section 7 consultation is not required.

Disturbance from the launches would be brief and, based on existing analysis of prior and current launches from the same area, is not expected to have a lasting impact or a measurable negative effect on wildlife, including migratory bird populations and threatened or endangered species. Debris impact and booster drops in the broad ocean area off the coast are not expected to adversely affect marine mammal species. Early flight termination could result in widely scattered debris, but the probability of this debris hitting wildlife is remote.

Cultural Resources. Because all construction would take place on existing concrete pads or within previously graded or graveled areas, the proposed construction activities would have no effect on historic properties. The shallow trench required for fiber-optic

cable installation would be excavated on the access roads to LF-23. The trench would not go below the road sub-base. No impacts are anticipated to cultural resources as a result of fiber-optic cable installation. The 30th Space Wing has determined that National Historic Preservation Act Section 106 consultation is not required.

Environmental Justice. The Proposed Action would not result in disproportionately high or adverse effect on minority or low-income populations in the area.

Geology and Soils. The staging areas for any construction materials and equipment associated with the modification of the missile launch silo or Buildings 1959 and 1978 would be on existing paved surfaces. The shallow trench required for fiber-optic cable installation would be excavated on the access roads to LF-23. The trench would not go below the road sub-base, and the road surface would be re-paved. No impacts to geology and soils are anticipated.

The amount of aluminum oxide deposited on the ground from the launch would not seriously change the soil chemistry. The hydrogen chloride exhaust from the ABV would be buffered by the soil and would not dramatically alter the soil pH.

Hazardous Materials and Hazardous Waste. The Proposed Action is not expected to substantially increase the volume of hazardous materials used, or hazardous waste generated, at Vandenberg AFB. Hazardous materials and hazardous waste would be handled and disposed of in accordance with appropriate spill prevention, containment, and control measures and hazardous materials handling regulations.

Health and Safety. Overall there would be a minimal increase in health and safety risk in comparison to current activities at Vandenberg AFB from launch site preparation and operation and transportation of hazardous materials. Adherence to the safety systems on Vandenberg AFB would preclude any impacts to worker or public health as a result of the Proposed Action.

Infrastructure. Impacts to transportation from contractor and program personnel during silo modification and the 20 personnel required for routine missile transfer and launch preparation activities would be minimal. The limited number of launch events would not have any substantial impact on existing transportation patterns or volume on or off base. All infrastructure systems have adequate capacity to support anticipated demands.

Land Use. No adverse impacts to current on-base land use are anticipated. ABV launches would be performed under existing agreements between Vandenberg AFB and park/beach authorities. The California Coastal Commission has concurred with a Negative Determination for coastal zone impacts.

Noise. Noise impacts from prior Vandenberg AFB launches have been determined to be short term and insignificant. The ABV flight test launch noise would likely fall within or

below the noise level measurements of previously approved Minuteman launch vehicles. Any noise impacts would also be short in duration.

Water Resources. Launch preparation activities would follow spill prevention, containment, and control measures and thus minimize any potential impacts to surface water. Blast residue released during launch activities would be contained within the launch silo. Most of the aluminum oxide from the ABV launch would be suspended in the air and dispersed over very large areas. The hydrogen chloride, under the most conservative rain conditions, would be diluted by the water and would not appreciably change the pH of the water. Launches scheduled during periods of precipitation could be canceled or postponed to eliminate the probability of contaminating storm water runoff and nearby water resources.

Alternatives

Under the No-action Alternative, no environmental consequences associated with the ABV development and launch activities are anticipated.

CONCLUSION: The resulting environmental analysis shows that no significant impacts would occur from the proposed ABV development and test activities. Preparation of an Environmental Impact Statement, therefore, is not required. A follow-up action list will be developed and completed by the Executing Agent to ensure compliance with the actions described in the EA.

DEADLINE FOR RECEIPT OF WRITTEN COMMENTS: 29 August 2002

POINT OF CONTACT: Submit written comments or requests for a copy of the ABV Verifications Flights EA to:

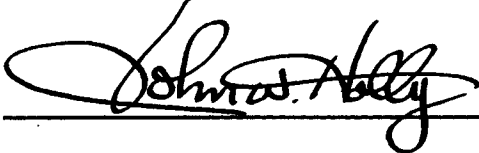
U.S. Army Space and Missile Defense Command
Attention: SMDC-EN-V (David Hasley)
Post Office Box 1500
Huntsville, AL 35807-3801

**ALTERNATE BOOST VEHICLE (ABV) VERIFICATION TESTS
ENVIRONMENTAL ASSESSMENT**

AGENCY: Missile Defense Agency

ACTION: Finding of No Significant Impact

PROPONENT:



DATE: AUG 30 2002

JOHN W. HOLLY
Brigadier General, U.S. Army
Program Director
Ground-Based Midcourse Defense

APPROVED:



DATE: AUG 30 2002

RONALD T. KADISH
Lieutenant General, USAF
Director

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19. ABSTRACT <i>(Continue on reverse if necessary and identify by block number)</i> <p>The Missile Defense Agency is currently developing the Ground-Based Midcourse Defense (GMD) Element, which is designed to protect the United States in the event of a limited ballistic missile attack. A Ground-Based Interceptor (GBI) is an integral component of the GMD Element. Development of the current GBI booster vehicle has been more challenging than originally anticipated. Congressional direction in 2001 included the development of a backup booster option. A decision was made to develop and test a second booster vehicle, the Alternate Booster Vehicle (ABV). Up to six ABV test flights from Vandenberg AFB over a 5-year period are proposed. These proposed ABV test flights represent another portion of the GMD Element development.</p> <p>The following existing facilities on Vandenberg AFB would be used: Building 1819 and 1555 for ABV integration and checkout; Launch Facility-23 for launch of the ABV, Building 1978 as a Launch Control Center, and Building 1959 as a communication center. No intercepts of the ABV are planned as part of the ABV tests.</p>					
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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Introduction

The Missile Defense Agency is the Department of Defense organization responsible for developing missile defenses for the United States. The Missile Defense Agency is developing the Ground-Based Midcourse Defense (GMD) Element of the conceptual Ballistic Missile Defense System (BMDS) as part of this effort. The BMDS concept is to defend against threat missiles in each phase or segment of the missile's flight. There are three segments of this conceptual system in various stages of technology development: Boost Phase Defense, Midcourse Defense, and Terminal Defense. Each segment of the BMDS is being developed to destroy an attacking missile in the corresponding boost, mid-course, or terminal phase of its flight. The boost phase is the portion of a missile's flight in which it is producing thrust to gain altitude and acceleration. This phase usually lasts between 3 to 5 minutes. During the mid-course phase, which occurs outside the earth's atmosphere for medium and long-range missiles, the missile is coasting in a ballistic trajectory. This phase can last as long as 20 minutes in the case of intercontinental ballistic missiles. During the Terminal Phase, the missile enters the atmosphere and continues on to its target. This phase lasts approximately 30 seconds for intercontinental ballistic missiles.

The Missile Defense Agency's ultimate goal is to develop an integrated BMDS that would be able to destroy an attacking missile in any phase of its flight. However, each prospective element of the different segments of the conceptual BMDS is at a different stage of development and would have a different timetable for integration into the eventual BMDS. Consequently, each element is being designed to provide some capability to defend against an attacking ballistic missile independent of other elements within an overall system. The BMDS development concept is to integrate promising technologies into BMDS elements as their capabilities are demonstrated through testing. The GMD Element is designed to protect the United States in the event of a limited ballistic missile attack by destroying the threat missile in the mid-course phase of its flight.

In 1999 the potential environmental impacts of the activities associated with two canisterized Ground-Based Interceptor (GBI) booster verification test flights from Vandenberg Air Force Base (AFB) were analyzed in the *Booster Verification Tests Environmental Assessment*. Development of the current GBI boost vehicle has been more challenging than originally anticipated. Congressional direction in the Defense Authorization Act for fiscal year 2001 included the development of a backup booster option involving proven technologies. A decision was made to develop and test a second boost vehicle, the uncanisterized Alternate Boost Vehicle (ABV). Up to six ABV test flights from Vandenberg AFB over about a 5-year period are proposed. These proposed ABV test flights are an important step in the development of the GMD Element.

The purpose of the Proposed Action is to confirm the ABV and silo designs, demonstrate silo egress, test the booster under operationally representative conditions, demonstrate vehicle maneuverability (control limits, vehicle response), demonstrate representative aero-

thermal loads and guidance algorithms, and conduct stressing maneuvers through a test flight of the ABV.

This ABV Verification Tests Environmental Assessment (EA) provides an analysis to support federal decisions relating to the potential environmental effects of activities associated with launching the ABV test flights from Vandenberg AFB. This EA analyzes the potential environmental impacts of all proposed pre-launch, launch, and post-launch activities. It also analyzes the potential environmental impacts of modifications of the existing Minuteman II silo at Launch Facility 23 (LF-23) on northern Vandenberg AFB; the use of existing missile assembly facilities, communications, and launch control buildings; and the installation of a fiber-optic communications line connecting LF-23 to the existing base communication system.

Program Activities

The following facilities, located on Vandenberg AFB, would be used under the Proposed Action. Building 1555 or 1819 would be used for integration and checkout of the ABV flight vehicle when it arrives at Vandenberg AFB. The ABV tests would be conducted from a modified Minuteman II silo at LF-23 (Building 1963). The ABV test Launch Control Center and the communication center would be located approximately 1.5 kilometers (0.9 mile) northeast of LF-23 in Buildings 1978 and 1959, respectively. Building 1959 may serve as a back-up Launch Control Center.

Minor modifications and site preparation would be required at the LF-23 launch site. The proposed launch site would include the launch silo, the silo interface vault equipment located within the existing Minuteman launch equipment room, the existing silo access roadways, site utility distribution, and any auxiliary mechanical support equipment or junction boxes required to support the launch operation. Site preparation would include relocation of an existing re-radiating tower with antennas and modifying the existing silo at LF-23 to receive a prefabricated launch station that would accommodate installation of the ABV. Other modifications would include preparation of the existing launch equipment room for installation of silo interface vault equipment. A "headworks," consisting of a foundation and silo top block, would provide tie-down points or other interfaces for insertion and removal of the ABV. A non-mechanical launch silo environmental cover, which would protect the silo from the elements, would be installed and removed with a crane or similar equipment.

The ABV would consist of a commercially available, solid propellant booster consisting of three stages and an exoatmospheric kill vehicle emulator that may contain a divert and attitude control system. No intercepts of the boosters are planned as part of these ABV tests. The three-stage missile would contain less hydroxyl-terminated polybutadiene solid rocket fuel propellant (no more than 30,400 kilograms [67,000 pounds]) than contained in the Minuteman III previously flown in this area. The ABV tests are required to validate an alternate booster design for the GBI interceptor as directed by the Congress.

For the proposed flight tests, the ABV would travel westward over the Pacific Ocean, approximately 6,500 kilometers (4,040 miles), to a proposed termination point north of the Ronald Reagan Ballistic Missile Test Site (RTS), U.S. Army Kwajalein Atoll.

Alternatives

The No-action Alternative of the ABV program has been evaluated and would result in no environmental consequences. Vandenberg AFB would continue to launch missiles as analyzed in prior environmental documents.

Two alternative locations were considered for the ABV launches: RTS and Cape Canaveral, Florida. No silos exist at Cape Canaveral and only uncompleted silos exist at RTS. Consideration was given to new construction at Cape Canaveral; however, new construction for an entire launch complex would cost up to twice the amount of reconfiguring LF-23 and would take up to three times as long. This alternative would not meet mission schedule requirements and would result in unreasonable delay to the testing program and the ability to provide a contingency defense. Additionally, an existing test range with existing sensors and flight safety system is required in order to meet the schedule. Based on the schedule requirements to conduct these tests, the only locations that could reasonably provide the capability and maintain schedule were RTS (by completing the existing silos at Meck Island) and Vandenberg AFB (modifying an existing Minuteman silo). While a launch silo capability at RTS could be completed in time to perform the testing, that testing would adversely affect other ongoing testing from Meck Island. Additionally, performing the required trajectories from Meck would require performing significant dog-leg maneuvers which are: (1) not very representative for the booster and (2) more difficult for the booster to perform, so it adds unnecessary risk to the booster flights.

Three additional alternative LFs were initially evaluated as potential launch sites for the ABV tests: LF-25, LF-24, and LF-07. These sites were eliminated from further study because of constraints such as existing adjacent structures, more extensive renovation requirements, more potential for impact to archaeological resources, and longer fiber-optic cable runs. In addition, LF-21 was eliminated because the silo configuration is for a canisterized missile and the proposed ABV configuration is for a non-canisterized missile.

Methodology

To assess the potential for impacts, a list of activities necessary to accomplish the Proposed Action was developed. The affected environment at all applicable locations was then described. Next, proposed activities were analyzed within the context of the existing environment to determine the environmental effects of these activities.

Several areas of environmental consideration were originally considered to provide a context for understanding the potential effects of the Proposed Action and to provide a basis for assessing the severity of potential impacts. These areas included air quality, airspace, biological resources, cultural resources, environmental justice, geology and soils, hazardous materials and waste, health and safety, infrastructure, land use, noise,

socioeconomics, and water resources. These areas were analyzed as applicable for the proposed location or activity.

No new impacts to airspace are anticipated. The ABV flight tests would be conducted from an existing missile launch location. No adverse impacts or environmental health and safety risks that may disproportionately affect minority or low-income communities or children from prior or current Vandenberg AFB missile launches have been identified. Personnel would be drawn from an existing workforce with minimal beneficial impacts to socioeconomics in the affected regions. These resources are not discussed further.

Environmental Consequences of the Proposed Action

Only those activities for which a potential environmental concern was determined are described within each resource summary.

Air Quality

Facility modifications and site preparation activities necessary for the ABV tests would have a localized, minimal impact on air quality. No exceedance of air quality standards or health-based standards of non-criteria pollutants would be anticipated.

Missile launches are short-term, discrete events, thus allowing time between launches for emissions to be dispersed. Blast residue (propellant byproducts, paint burned from the silo, and umbilical cables) released during launch activities would be manually collected, containerized, managed, and disposed of in accordance with federal, state, and local statutes, laws, regulations, and requirements. Most of the aluminum oxide from the ABV launch would be suspended in the air and dispersed over very large areas. Emissions from launch preparation and launch activities would be regulated in accordance with the agreement between Vandenberg AFB and the Santa Barbara County Air Pollution Control District for Vandenberg AFB and are not anticipated to cause exceedances of air quality standards.

Biological Resources

There would be little to no ground disturbance and resultant impact to vegetation from modification activities. Fiber-optic cable installation is anticipated to require minor excavation on the existing roads, which should pose no impact to adjacent vegetation. A temporary aboveground fiber-optic cable may be utilized as an interim solution to the underground cable. All transportation of equipment and materials would be conducted in accordance with applicable spill prevention, containment, and control measure regulations, which would preclude impacts to biological resources.

The increased presence of personnel would tend to cause birds and other mobile species of wildlife to temporarily leave the areas that would be subject to the highest level of noise. Therefore, no direct physical auditory effects to wildlife are anticipated. Proposed activities would not impact water bodies that could potentially contain the endangered tidewater goby and unarmored threespine stickleback, or the threatened California red-legged frog. Proposed activities may affect, but are unlikely to adversely affect,

threatened or endangered birds in the area. Proposed activities are not anticipated to result in impacts to the threatened southern sea otter or other sensitive marine mammals in adjacent offshore areas.

Blast residue would be contained within the silo, preventing any impacts on vegetation. Nominal launch activities during dry conditions could result in the deposition of very small amounts (pounds) of nontoxic aluminum oxide from missile exhaust. Rain within 2 hours of launch could cause hydrogen chloride to be deposited in small quantities. This chemical, when emitted during solid propellant missile launches for very large flight vehicles (such as the space shuttle), is known to injure plant leaves and affect wildlife. However, the potential impact on vegetation and wildlife from the proposed launch of the smaller ABV is expected to be slight.

Noise from Minuteman launches ranges from 125 decibels approximately 3 kilometers (2 miles) from the launch site to 80 decibels approximately 13 kilometers (8 miles) from the launch site. Although the level of noise for the ABV during launch and flight is expected to be within this range or less and relatively short in duration, noise monitoring would be performed during the initial launch of an ABV. Harbor seal monitoring would be conducted during the pupping season (March through June) in accordance with Vandenberg AFB guidelines. The U.S. Air Force, 30th Space Wing, Vandenberg AFB has requested that ABV launches be included along with previously approved Peacekeeper and Minuteman launches in the 10 (total) intercontinental ballistic missile launches allowed under their 5-year programmatic permit and letter of authorization with the National Marine Fisheries Service. No expansion of the 10 launch (total) limit is desired or requested. The program will not proceed with launches until coordination with the National Marine Fisheries Service is complete. Disturbance from the launches would be brief and, based on existing analysis of prior and current launches from the same area, is not expected to have a lasting impact nor a measurable negative effect on wildlife, including migratory bird populations and threatened or endangered species. Debris impact and booster drops in the broad ocean area off the coast are not expected to adversely affect marine mammal species. Early flight termination could result in widely scattered debris, but the probability of this debris hitting wildlife is remote. The 30th Space Wing has determined that Endangered Species Act Section 7 consultation is not required.

Cultural Resources

Since all construction would take place on existing concrete pads or within previously graded or graveled areas, the proposed construction activities would have no effect on historic properties. The shallow trench required for fiber-optic cable installation would be excavated on the access roads to LF-23. The trench would not go below the road sub-base. No impacts are anticipated to cultural resources as a result of fiber-optic cable installation. If previously undocumented cultural resource items are discovered during ground-disturbing activities, work would immediately cease until the items are properly assessed in accordance with guidance provided by the State Historic Preservation Officer and the Advisory Council on Historic Preservation. In addition, any discovery of previously unidentified cultural resources would be reported to the Vandenberg Base Historic Preservation Officer. Personnel would receive a brief orientation involving a definition of

cultural resources and protective federal regulations. The 30th Space Wing has determined that National Historic Preservation Act Section 106 consultation is not required.

Geology and Soils

Launch support equipment installation may result in minor, short-term impacts to adjacent soils. The staging areas for any construction materials and equipment associated with the modification of the missile launch silo or Buildings 1959 and 1978 would be on existing paved surfaces. The shallow trench required for fiber-optic cable installation would be excavated on the access roads to LF-23. The trench would not go below the road sub-base, and the road surface would be re-paved. No impacts to geology and soils are anticipated.

The amount of aluminum oxide deposited on the ground from the launch would not seriously change the soil chemistry. The hydrogen chloride exhaust from the ABV would be buffered by the soil and would not dramatically alter the soil pH.

Hazardous Materials and Waste

The Proposed Action is not expected to substantially increase the volume of hazardous materials used, or hazardous waste generated, at Vandenberg AFB. Hazardous materials and hazardous waste would be handled and disposed of in accordance with appropriate spill prevention, containment, and control measures and hazardous materials handling regulations. Vandenberg AFB would look for opportunities to reduce/recycle the hazardous materials used during all stages of preparation, including launch site modification, and operation.

Health and Safety

Overall there would be a minimal increase in health and safety risk in comparison to current activities at Vandenberg AFB from launch site preparation and operation and transportation of hazardous materials. Modification of existing facilities is routinely accomplished and presents only occupational-related effects on the safety and health of workers involved in the performance of the activity. Facility and equipment design would incorporate measures to minimize the potential for and impact of accidents. The potential for mishap during transportation and handling of the ABV would be small due to safety precautions that would be in place. Specific health and safety plans, including evacuation plans, are in place. Onsite emergency response teams would be informed of potential hazards of the Proposed Action and would be on standby. Local emergency teams would be notified if necessary. Adherence to the safety systems on Vandenberg AFB would preclude any impacts to worker or public health as a result of the Proposed Action.

Infrastructure

Impacts to transportation from the approximately 15 transient contractor and program personnel during silo modification and the nominal 20 personnel required for routine missile transfer and launch preparation activities would be minimal. The limited number of launch events would not have any substantial impact on existing transportation patterns or

volume on or off base. Any potential disruption to existing base electricity or communication would be short term. All infrastructure systems have adequate capacity to support anticipated demands.

Land Use

No adverse impacts to current on-base land use are anticipated. The potential for minor, short-term adverse impacts on coastal access, recreation, and commercial and sport fishing industries would be minimized by following applicable current Vandenberg AFB policies and procedures such as restricting launches to weekdays only, with night or weekend launches as a possible alternative. ABV launches would be performed under existing agreements between Vandenberg AFB and park/beach authorities. The California Coastal Commission has concurred with a Negative Determination for coastal zone impacts.

Noise

Noise impacts from prior Vandenberg AFB launches have been determined to be short term and insignificant. The ABV flight test launch noise would likely fall within or below the noise level measurements of previously approved Minuteman launch vehicles. Noise impacts would also be short in duration.

Water Resources

Launch preparation activities would follow spill prevention, containment, and control measures and thus minimize any potential impacts to surface water. Blast residue released during launch activities would be contained within the launch silo. Most of the aluminum oxide from the ABV launch would be suspended in the air and dispersed over very large areas. The hydrogen chloride, under the most conservative rain conditions, would be diluted by the water and would not appreciably change the pH of the water. Launches scheduled during periods of precipitation could be canceled or postponed to eliminate the probability of contaminating storm water runoff and nearby water resources.

Cumulative Impacts

Cumulative impacts are those that result when impacts of an action are combined with the impacts of past, present, and reasonably foreseeable future actions at a location. Construction and renovation projects such as refurbishment of facilities and launch activities occur on Vandenberg AFB on a regular basis. Cumulative impacts to air quality, biological resources, cultural resources, geology and soils, hazardous materials and waste management, health and safety, infrastructure, land use, noise, and water would potentially occur if all of the projects were to happen concurrently. However, the Proposed Action (up to six launches over a 5-year period), when combined with the staggered construction and launch schedules for other actions, as well as the use of different areas on the base, is not anticipated to result in significant cumulative impacts.

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ACRONYMS AND ABBREVIATIONS

ACRONYMS AND ABBREVIATIONS

30 CES/CEV	30 th Civil Engineering Squadron Environmental Management Flight
30 CES/CEVPN	30 th Civil Engineering Squadron/Environmental Management
30 CES/CEX	Readiness Flight
30 SW	30 th Space Wing
30 SW/CC	30 th Space Wing Commander
30 SW/SE	30 th Space Wing Safety Office
ABV	Alternate Boost Vehicle
AFB	Air Force Base
AFI	Air Force Instruction
BMDS	Ballistic Missile Defense System
CAAQS	California Ambient Air Quality Standards
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CNEL	Community Noise Equivalent Level
CZM	Coastal Zone Management
DACS	Divert and Attitude Control System
dB	decibel
dBA	A-weighted decibel
DNL	A-weighted Day-Night Equivalent Sound Level (L _{dn})
DoD	Department of Defense
DOT	Department of Transportation
EA	environmental assessment
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
EPP	Environmental Protection Plan
ESQD	explosive safety quantity-distance
EWR	Eastern and Western Range
FAA	Federal Aviation Administration
FTS	flight termination system

GBI	Ground-Based Interceptor
GMD	Ground-Based Midcourse Defense
KV	Kill Vehicle
LCC	Launch Control Center
LER	launch equipment room
LF	Launch Facility
LHA	launch hazard area
MDA	Missile Defense Agency
$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
mg/m^3	milligrams per cubic meter
MSDS	Material Safety Data Sheet
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
OSHA	Occupational Safety and Health Administration
PM-10	particulate matter of 10 microns in diameter or smaller
PCB	polychlorinated biphenyl
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
ROI	region of influence
RTS	Reagan Test Site
SBCAPCD	Santa Barbara County Air Pollution Control District
SOP	standard operating procedure
USC	United States Code
WTR	Western Test Range

CONTENTS

CONTENTS

EXECUTIVE SUMMARY	es-1
-------------------------	------

ACRONYMS AND ABBREVIATIONS

1.0	PURPOSE AND NEED	1-1
1.1	INTRODUCTION	1-1
1.2	BACKGROUND	1-1
1.3	PURPOSE AND NEED	1-4
1.4	DECISION TO BE MADE.....	1-4
1.5	SCOPE OF THE ENVIRONMENTAL ASSESSMENT	1-4
1.6	RELATED DOCUMENTATION	1-5
2.0	DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES	2-1
2.1	PROPOSED ACTION.....	2-1
2.1.1	ALTERNATE BOOST VEHICLE DESCRIPTION	2-2
2.1.2	SITE PREPARATION	2-2
2.1.3	PRE-FLIGHT ACTIVITIES	2-8
2.1.4	FLIGHT ACTIVITIES.....	2-9
2.1.5	POST-FLIGHT ACTIVITIES.....	2-11
2.2	NO-ACTION ALTERNATIVE	2-11
2.3	ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD.....	2-11
2.3.1	ADDITIONAL SITES CONSIDERED ON VANDENBERG AFB	2-12
2.3.1.1	Launch Facility-25.....	2-12
2.3.1.2	Launch Facility-24.....	2-12
2.3.1.3	Launch Facility-07.....	2-13
3.0	AFFECTED ENVIRONMENT	3-1
3.1	AIR QUALITY	3-2
3.2	BIOLOGICAL RESOURCES.....	3-4
3.3	CULTURAL RESOURCES.....	3-10
3.4	GEOLOGY AND SOILS.....	3-11
3.5	HAZARDOUS MATERIALS AND HAZARDOUS WASTE	3-12
3.6	HEALTH AND SAFETY	3-15
3.7	INFRASTRUCTURE.....	3-17
3.8	LAND USE	3-19
3.9	NOISE	3-20
3.10	WATER RESOURCES.....	3-24
4.0	ENVIRONMENTAL CONSEQUENCES	4-1
4.1	PROPOSED ACTION.....	4-1
4.1.1	AIR QUALITY	4-1
4.1.2	BIOLOGICAL RESOURCES.....	4-4
4.1.3	CULTURAL RESOURCES	4-10
4.1.4	GEOLOGY AND SOILS	4-11
4.1.5	HAZARDOUS MATERIAL AND WASTE	4-12

4.1.6	HEALTH AND SAFETY	4-15
4.1.7	INFRASTRUCTURE	4-17
4.1.8	LAND USE	4-21
4.1.9	NOISE	4-22
4.1.10	WATER RESOURCES	4-24
4.2	CUMULATIVE IMPACTS	4-25
4.3	ENVIRONMENTAL EFFECTS OF THE NO-ACTION ALTERNATIVE	4-26
4.4	ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED	4-26
4.5	CONFLICTS WITH FEDERAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS FOR THE AREA CONCERNED	4-26
4.6	ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL	4-27
4.7	IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES	4-27
4.8	RELATIONSHIP BETWEEN SHORT-TERM USE OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY	4-27
4.9	NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL	4-27
4.10	FEDERAL ACTIONS TO ADDRESS ENVIRONMENTAL JUSTICE IN MINORITY POPULATIONS AND LOW-INCOME POPULATIONS (EXECUTIVE ORDER 12898)	4-28
4.11	FEDERAL ACTIONS TO ADDRESS PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS (EXECUTIVE ORDER 13045)	4-28
5.0	REFERENCES	5-1
6.0	LIST OF PREPARERS	6-1
7.0	AGENCIES AND INDIVIDUALS CONTACTED	7-1

APPENDICES

APPENDIX A DISTRIBUTION LIST

APPENDIX B CORRESPONDENCE

FIGURES

1-1	Vandenberg Air Force Base and Project Location Map, California.....	1-2
2-1	Conceptual Alternate Boost Vehicle.....	2-3
2-2	Representative Booster Vehicles Comparison.....	2-4
2-3	Conceptual Modified Minuteman II Site Plan, Vandenberg Air Force Base	2-5
2-4	Proposed Fiber Optic Cable Routes, Vandenberg AFB	2-7
3-1	Sensitive Habitat for Listed Wildlife Species on Vandenberg AFB, Northern Vandenberg AFB.....	3-7

TABLES

3-1	Ambient Air Quality Standards	3-3
3-2	Listed Species Known or Expected to Occur in the Vicinity of the Proposed Action	3-8
3-3	Noise Levels of Common Sources	3-22

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1.0

PURPOSE AND NEED

1.0 PURPOSE AND NEED

1.1 INTRODUCTION

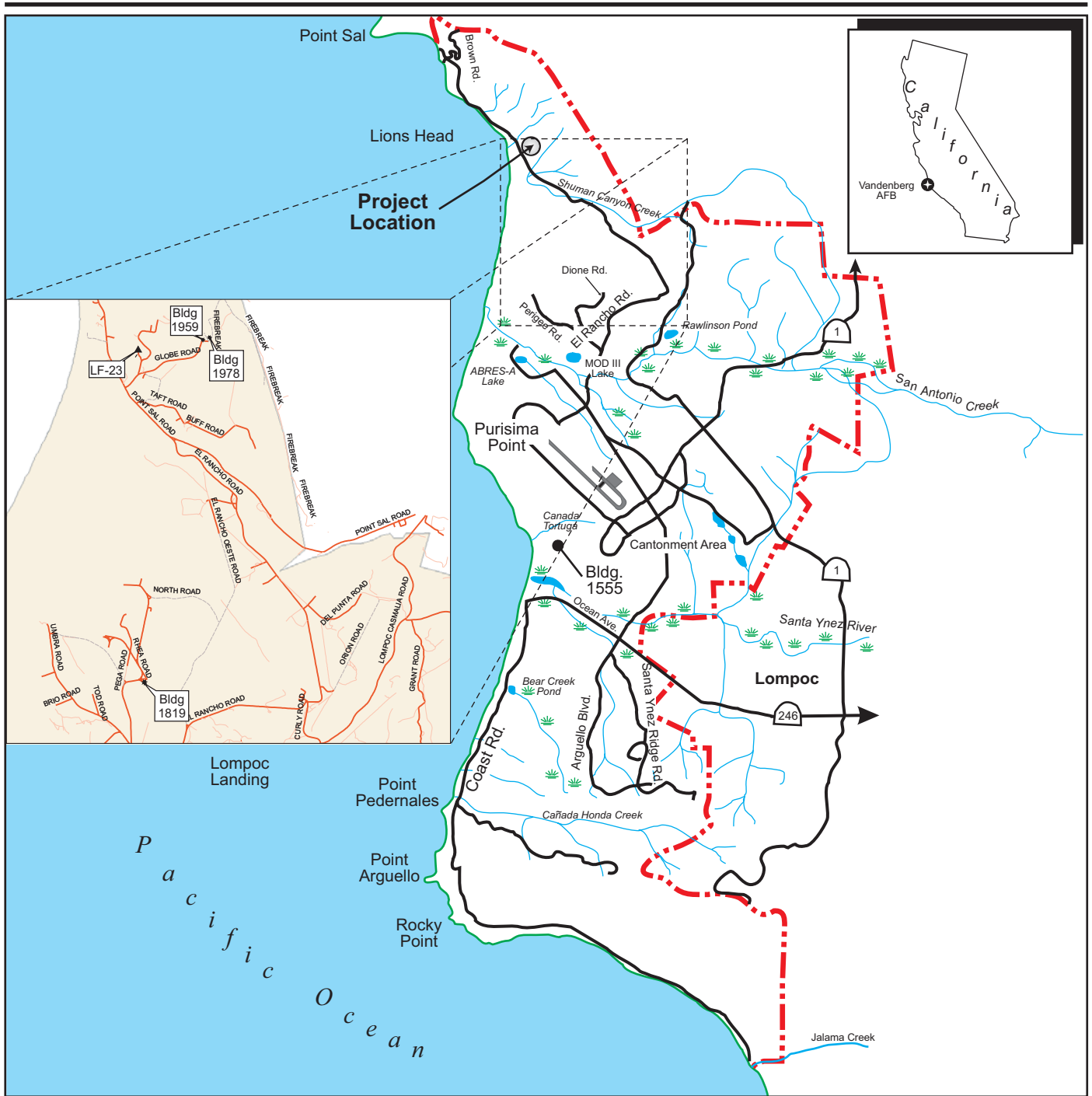
This environmental assessment (EA) analyzes the potential environmental impacts for the activities associated with up to six Alternate Boost Vehicle (ABV) test flights proposed at Vandenberg Air Force Base (AFB) (figure 1-1) over a 5-year period, beginning as early as the spring of 2003. This EA analyzes the potential environmental impacts of all pre-launch, launch, and post-launch operational activities. It also analyzes the potential environmental impacts of modifications of the existing Minuteman II silo at Launch Facility 23 (LF-23); the use of existing missile assembly facilities, communications, and launch control buildings; and the installation of a fiber-optic communications line connecting LF-23 to the existing base communication system.

This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, and its implementing regulations, 40 U.S. Code (USC) 4321 *et seq.* and 42 Code of Federal Regulations (CFR) 1500-1508, respectively; 32 CFR Part 61 (Army Regulation 200-2), *Environmental Analysis of Army Actions*; 32 CFR 989 (Air Force Instruction 32-7061), *Environmental Impact Analysis Process*; Department of Defense (DoD) Instruction 4715.9, *Environmental Planning and Analysis*; and Executive Order 12114, *Environmental Effects Abroad of Major Federal Actions*.

1.2 BACKGROUND

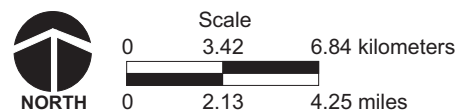
The Missile Defense Agency (MDA) is the DoD organization responsible for developing missile defenses for the United States. As part of this effort, the MDA is developing the Ground-Based Midcourse Defense (GMD) Element of the conceptual Ballistic Missile Defense System (BMDS). The BMDS concept is to defend against threat missiles in each phase or segment of the missile's flight. There are three segments of this conceptual system in various stages of technology development: Boost Phase Defense, Midcourse Defense, and Terminal Defense. Each segment of the BMDS is being developed to destroy an attacking missile in the corresponding boost, mid-course, or terminal phase of its flight. The boost phase is the portion of a missile's flight in which it is producing thrust to gain altitude and acceleration. This phase usually lasts between 3 to 5 minutes. During the mid-course phase, which occurs outside the earth's atmosphere for medium and long-range missiles, the missile is coasting in a ballistic trajectory. This phase can last as long as 20 minutes in the case of intercontinental ballistic missiles. During the Terminal Phase, the missile enters the atmosphere and continues on to its target. This phase lasts approximately 30 seconds for intercontinental ballistic missiles.

The MDA's ultimate goal is to develop an integrated BMDS that would be able to destroy an attacking missile in any phase of its flight. However, each prospective element of the different segments of the conceptual BMDS is at a different stage of development and



EXPLANATION

- Land Area
- Water Area
- Vandenberg Air Force Base Boundary
- Road
- River / Creek
- Wetlands



Vandenberg Air Force Base and Project Location Map

California

Figure 1-1

would have a different timetable for integration into the eventual BMDS. Consequently, each element is being designed to provide some capability to defend against an attacking ballistic missile independent of other elements within an overall system. The BMDS development concept is to integrate promising technologies into BMDS elements as their capabilities are demonstrated through testing. The GMD Element is designed to protect the United States in the event of a limited ballistic missile attack by destroying the threat missile in the mid-course phase of its flight.

The proposed ABV test flights at Vandenberg AFB have an important role in the potential development and capability of the GMD Element of the conceptual BMDS. The GMD Test Program currently utilizes surplus U.S. Air Force missiles to represent the integrated GMD Element Ground-Based Interceptor (GBI). In 1999 the *Booster Verification Tests Environmental Assessment* was prepared to analyze the potential environmental impacts of the activities associated with two canisterized, booster verification test flights from LF-21 at Vandenberg AFB. As the GMD System matures and moves towards operational deployment, current missiles will be replaced by a launch vehicle that more closely meets GMD mission requirements. Current GMD Test Program planning also calls for up to two rapid prototype demonstration tests at Vandenberg AFB, the first in the second quarter of fiscal year 2003. The Taurus Lite Demonstration launch test, which is being addressed in a Record of Environmental Consideration, would validate the vehicle in operationally representative conditions. A mass simulated non-deployable payload would represent the kill vehicle (KV) for dynamic test purposes. Launch site activities would be conducted at Site 576E on Vandenberg AFB. Handling operations at the launch site would be very similar to existing Taurus operations at this launch location.

Development of the current GBI boost vehicle has been more challenging than originally anticipated. Congressional direction in the National Defense Authorization Act for fiscal year 2001 (Public Law 106-398) included the development of a backup booster option involving proven technologies. A decision was made to develop and test a second boost vehicle, the ABV. The uncanisterized ABV test flights would require modifications to a different launch silo and would test the new design of the boost vehicles. Both LF-21 and the site chosen for the ABV testing could be used for future launches of interceptors from Vandenberg AFB, if the verification testing is successful and may require additional tests. However, such activities are beyond the scope of this EA, and will be addressed in the GMD Extended Test Range Environmental Impact Statement (EIS). The proposed ABV tests analyzed in this EA would be required whether or not MDA proceeds with the Extended Test Range.

Vandenberg AFB is located on approximately 400 square kilometers (154 square miles) of the south-central coast of California in western Santa Barbara County. Vandenberg AFB is the headquarters for the 30th Space Wing (30 SW). The primary missions at Vandenberg AFB are to launch and track satellites in space, test and evaluate U.S. intercontinental ballistic missile systems, and support aircraft operations in the Western Test Range (WTR). Nonmilitary, commercial space launch operations also occur at Vandenberg AFB.

The following facilities, located on Vandenberg AFB, would be used under the Proposed Action. Building 1555 or 1819 would be used for integration and checkout of the ABV

flight vehicle when it arrives at Vandenberg AFB. The ABV tests would be conducted from a modified Minuteman II silo at LF-23 (Building 1963). The ABV test Launch Control Center (LCC) and the communication center would be located approximately 1.5 kilometers (0.9 mile) northeast of LF-23 in Buildings 1978 and 1959, respectively. Building 1959 may serve as a backup LCC.

1.3 PURPOSE AND NEED

The proliferation of weapons of mass destruction and technology of long-range missiles is increasing the threat to our national security. The purpose of the proposed ABV tests is to confirm booster and silo designs, demonstrate silo egress, test the booster under operationally representative conditions, demonstrate vehicle maneuverability (control limits, vehicle response), demonstrate representative aero-thermal loads and guidance algorithms, and conduct stressing maneuvers. The ABV tests are needed to gain a higher degree of confidence through tests of an ABV under more operationally realistic conditions. Locations for ABV tests are limited because of the requirement for long-range and high-velocity testing capabilities, providing the capability to conduct testing in a reasonable and cost effective manner while maintaining the existing schedule. Vandenberg AFB and the associated WTR provide 10,000 kilometers (approximately 5,400 nautical miles) of open water flight space westward over the Pacific Ocean and based on current operations and existing support infrastructure is an ideal location for testing full aerodynamic profile and stressing performance parameters.

1.4 DECISION TO BE MADE

The MDA will decide whether to proceed with the ABV tests at Vandenberg AFB based on the findings of this EA and other factors. This EA provides decisionmakers an analysis of the potential impacts associated with conducting these tests on the central coast of California using Vandenberg AFB facilities, and provides the basis for a Finding of No Significant Impact or a determination to prepare an EIS.

1.5 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This EA describes and analyzes the potential environmental impacts of conducting up to six ABV flight tests over a period of about 5 years and identifies environmental permits that would be necessary to perform the proposed ABV tests. The environmental analysis summarizes and incorporates by reference the results of applicable previous GMD and Vandenberg AFB environmental analyses listed below.

Chapter 2.0 of this EA describes the Proposed Action, alternatives eliminated from further study, and the No-action Alternative. In addition to providing project information, this

section describes the general site setting of the Proposed Action and outlines proposed pre-launch, launch, and post-launch activities and operations.

Chapter 3.0 provides regional and site-specific existing conditions related to air quality, biological resources, cultural resources, geology and soils, hazardous materials and waste management, health and safety, infrastructure, land use, noise, and water resources. The regional information included in this section provides a background for understanding the context of the site-specific existing conditions that could affect or be affected by the Proposed Action.

Chapter 4.0 addresses the potential environmental consequences of the Proposed Action and the No-action Alternative on the resource areas analyzed. Potential mitigation measures are identified, where applicable. The mitigation measures are designed to ensure that none of the potential effects of the Proposed Action significantly impact the environment.

Chapters 5.0 through 7.0 identify references, preparers of this EA, and persons and agencies contacted, respectively.

In addition to the main text, the following appendices are included in this document:

- Appendix A—distribution list
- Appendix B—correspondence and certification regarding conditions relevant to the ABV EA

1.6 RELATED DOCUMENTATION

Ballistic Missile Defense Organization, 1994. *Ballistic Missile Defense Final Programmatic Environmental Impact Statement*.

U.S. Department of the Air Force, 1992. *Taurus Standard Small Launch Vehicle Program Environmental Assessment*, March.

U.S. Department of the Air Force, 1997. *Theater Ballistic Missile Targets Programmatic Environmental Assessment*, December.

U.S. Department of the Air Force, 1999. *Booster Verification Tests Environmental Assessment, Vandenberg Air Force Base, California*, March.

U.S. Department of the Air Force, 2000. *Final Environmental Assessment for Installation of the Lion's Head Fiber-Optic Cable System Vandenberg Air Force Base, California*, 23 February.

U.S. Army Space and Missile Defense Command, 2000. *National Missile Defense Deployment Environmental Impact Statement*, July.

U.S. Army Space and Missile Defense Command, 2002. *Record of Environmental Consideration, Continuation of Booster Verification (BV) Tests at Vandenberg Air Force Base (AFB)*.

U.S. Army Space and Missile Defense Command, 2002. *Record of Environmental Consideration, Taurus Lite Demonstration Launch Tests at Vandenberg Air Force Base (AFB)*.

Vandenberg Air Force Base, 1976. *Environmental Assessment for Minuteman and Thor Missile Launches*.

2.0

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This chapter describes the Proposed Action of launching up to six ABV test flights from Vandenberg AFB over about a 5-year period. Alternative actions considered but eliminated from further study and the No-action Alternative are also discussed in this chapter.

2.1 PROPOSED ACTION

The Proposed Action would include all aspects of the ABV tests including silo and facility modifications, flight vehicle transportation and storage, and all pre-flight, in-flight, and post-flight activities and operations, as described in more detail in the following sections. The ABV test flights would be launched from LF-23, located on north Vandenberg AFB. The ABV booster motors would be transported to Vandenberg AFB and integrated and inspected at Building 1555 or 1819, which would be used as a payload processing facility. Buildings 1959 and 1978, located approximately 2 kilometers (1.2 miles) northeast of LF-23, are proposed for communication support and an LCC, respectively. Under the Proposed Action, LF-23 and Buildings 1555, 1959, 1978, and 1819 would be used for their intended purpose and current use. Minor to no modifications would be made to these latter buildings. Underground fiber-optic cable would be installed between Building 1959 and LF-23 and between Buildings 1959 and 1978.

Minor modifications and site preparation would be required at the LF-23 launch silo site. The proposed launch site would include the launch silo, the silo interface vault equipment located within the existing Minuteman launch equipment room (LER), the existing silo access roadways, replacement of an existing re-radiating tower, site utility distribution, and any auxiliary mechanical support equipment or junction boxes required to support the launch operation. Modifications or site preparation of these launch components and other launch support facilities are described in greater detail in the following sections.

The U.S. Air Force, 30 SW, Vandenberg AFB has requested that ABV launches be included along with previously approved Peacekeeper and Minuteman launches in the 10 (total) intercontinental ballistic missile launches allowed under their 5-year programmatic permit and letter of authorization with the National Marine Fisheries Service. No expansion of the 10 launch (total) limit is desired or requested. Noise monitoring would be performed during the initial launch of an ABV, and harbor seal monitoring would be conducted during the pupping season (March through June) in accordance with Vandenberg AFB guidelines. The ABV program submitted a request for a Negative Determination to the California Coastal Commission stating the reasons that a consistency determination is not required for ABV launch activities. The California Coastal Commission has concurred with a Negative Determination for coastal zone impacts. The program will not proceed with launches until

coordination with the National Marine Fisheries Service is complete. The 30 SW has determined that Endangered Species Act Section 7 consultation is not required.

2.1.1 ALTERNATE BOOST VEHICLE DESCRIPTION

The ABV, as depicted in figure 2-1, would consist of commercially available, three-stage, solid propellant boosters and an exoatmospheric KV emulator. The KV emulator does not contain the seeker components and normally does not contain the Divert and Attitude Control System (DACS). The emulator is a mass that simulates the configuration of a real KV in terms of weight, center of gravity, and dynamic response characteristics without any functional parts. It is instrumented with accelerometers and microphones to record shock, vibration, and acoustic environments. While the baseline configuration does not contain a divert capability, this document examines the possibility that the KV will contain the DACS components, including the liquid propellants. However, no intercepts of target missiles are planned as part of the ABV tests.

The three-stage ABV missile, a variation of the Minuteman, has not been previously flight-tested in this proposed configuration. A comparison of the relative size of the ABV missile to other missiles is shown in figure 2-2.

The three-stage missile would contain no more than 30,400 kilograms (67,000 pounds) of a hydroxyl-terminated polybutadiene solid rocket fuel propellant, less than that contained in the Minuteman III missiles previously flown in this area. The ABV would have a flight termination system (FTS) that, when activated, detonates an explosive charge that ruptures the solid rocket motor casing, resulting in loss of pressure and termination of thrust.

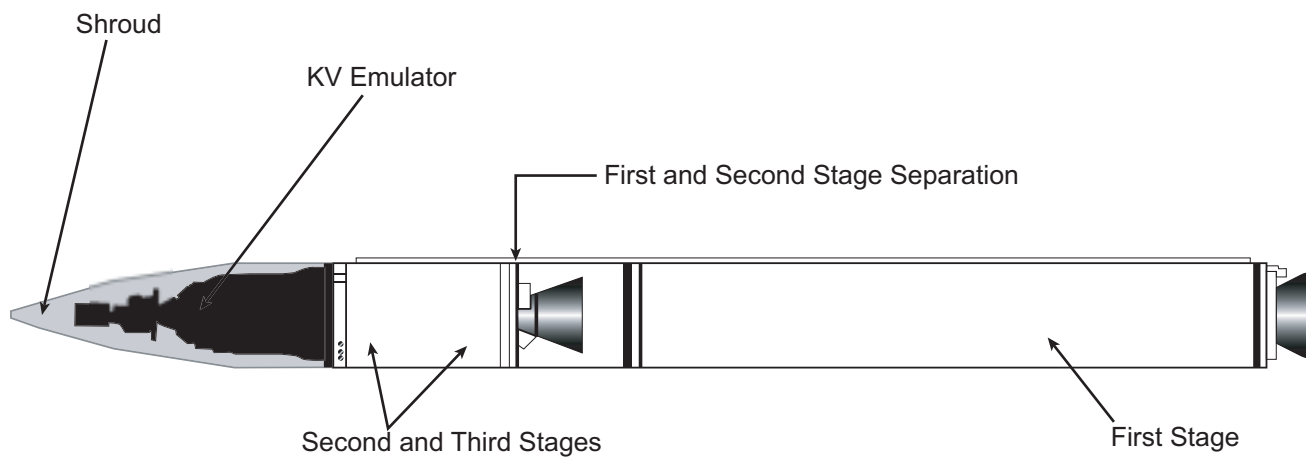
For the proposed flight tests, the ABV would travel westward over the Pacific Ocean, approximately 6,500 kilometers (4,040 miles) along trajectories currently used for launches from Vandenberg AFB, to a proposed termination point north of U.S. Army Kwajalein Atoll.

2.1.2 SITE PREPARATION

Five facilities located on north Vandenberg AFB would be required for the ABV tests: LF-23 and Buildings 1959, 1978, 1555, and 1819. The proposed communications support facility, Building 1959, and the LCC in Building 1978 would only require minor internal modifications to prepare for the ABV tests. Building 1555 or 1819 would be used for payload processing, interceptor integration and checkout prior to launch, and storage of testing and checkout equipment for the ABV missile, and would not require any modifications.

Silo and Building Modifications

A conceptual site plan for the use of LF-23 for ABV launches is shown in figure 2-3. ABV program site preparation would include modifying the existing silo at LF-23 to receive a prefabricated launch station that would accommodate installation of the ABV. Other modifications would include preparation of the existing LER for installation of Silo Interface Vault equipment. A "headworks," consisting of a foundation and silo top block, would



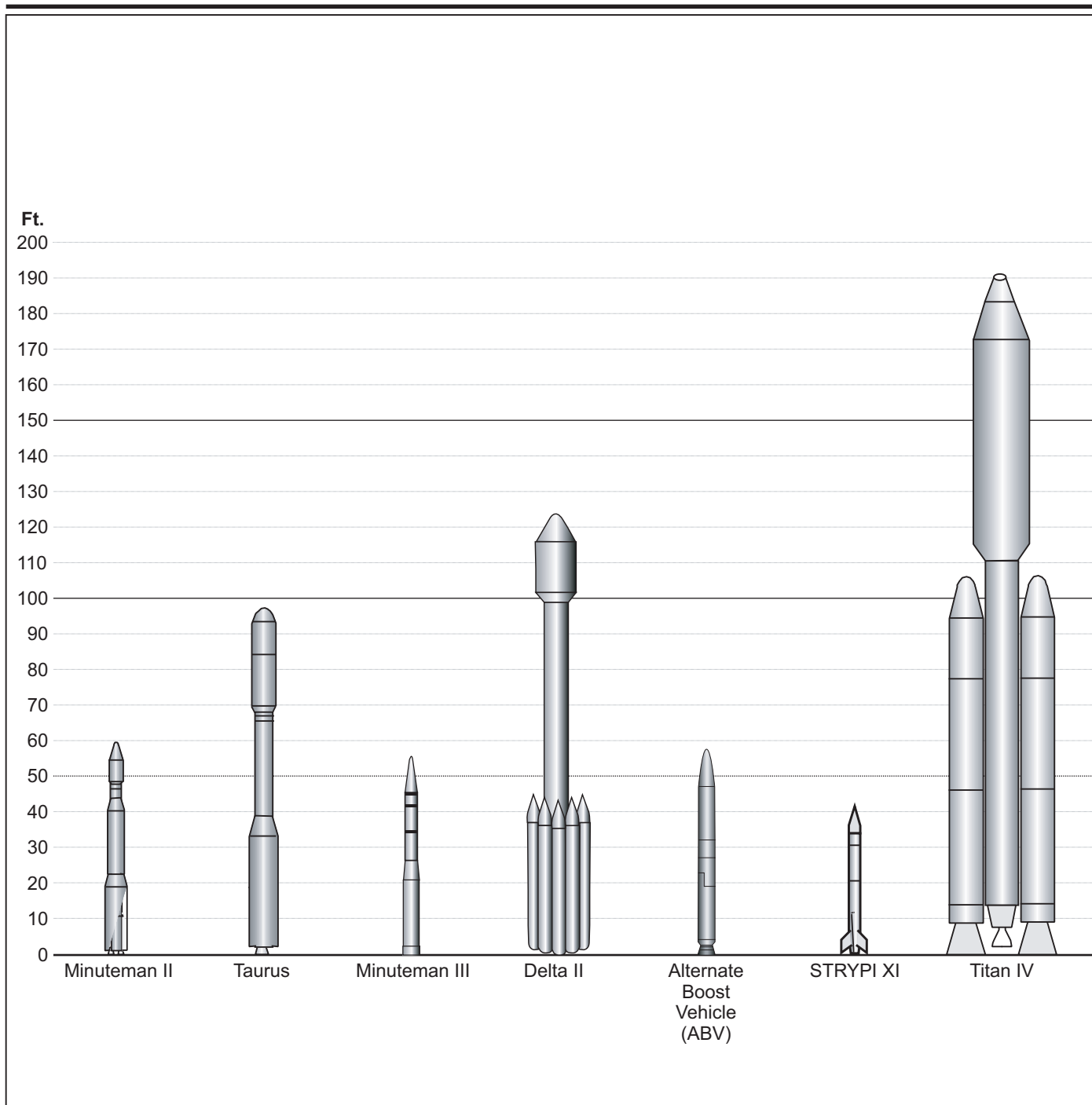
EXPLANATION

KV = Kill Vehicle

Conceptual Alternate Boost Vehicle

Unknown Scale

Figure 2-1

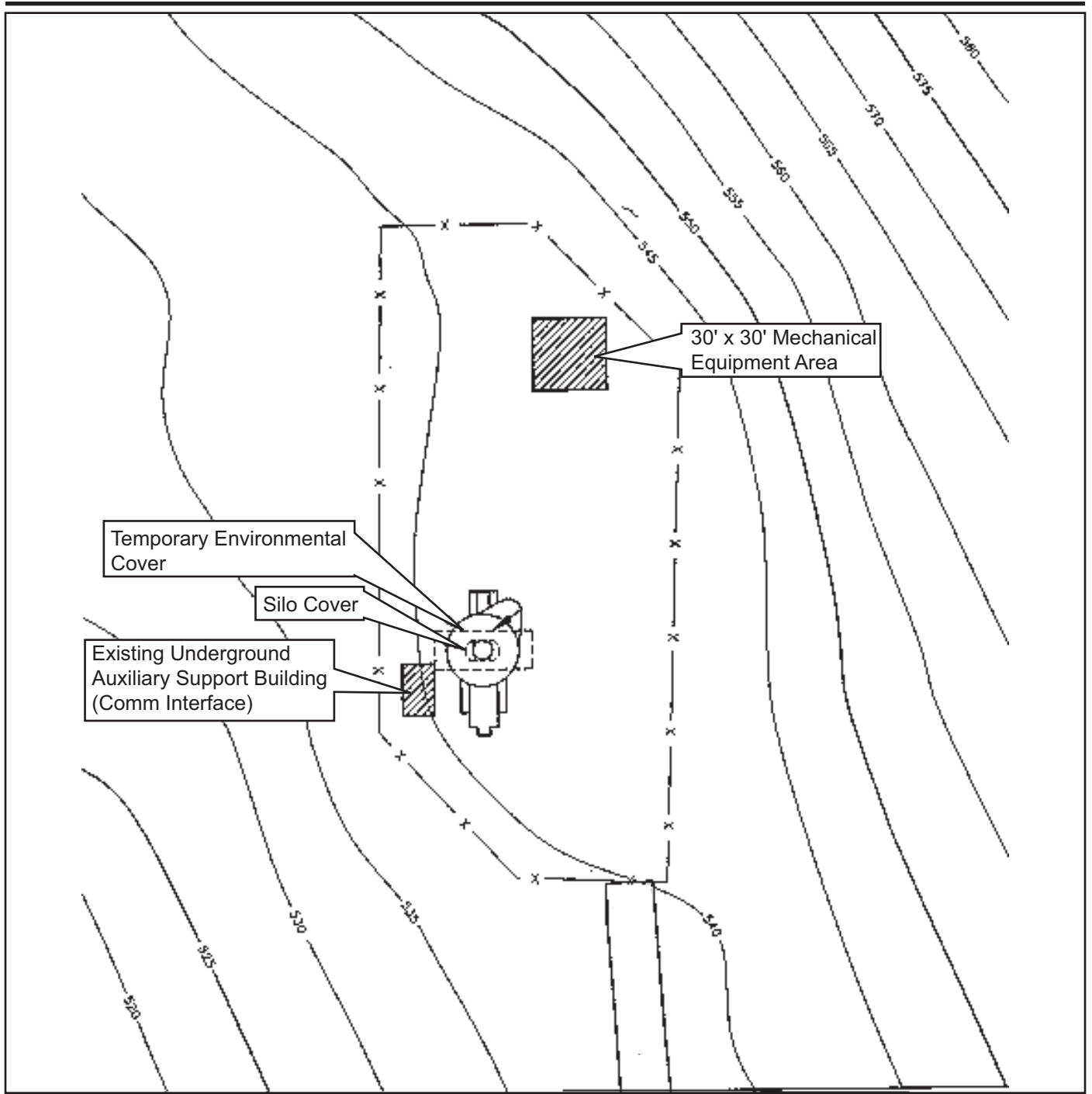


EXPLANATION

Titan IV included for comparison purposes only.

Representative Booster Vehicles Comparison

Figure 2-2



EXPLANATION

Conceptual Modified Minuteman II Site Plan



Unknown Scale

Vandenberg Air Force Base

Figure 2-3

provide tie-down points or other interfaces for insertion and removal of the ABV. A launch silo non-mechanical environmental cover, which would protect the silo from the elements, would be installed and removed with a crane or similar equipment. Approximately 15 workers would be required for the silo modification phase of the Proposed Action.

All construction staging areas would be located on paved areas. The ABV program would perform sampling and abatement for lead-based paint, asbestos, and polychlorinated biphenyls (PCBs) as required prior to modification, using Vandenberg AFB-approved procedures. If any of the modifications require the removal of these hazardous wastes, they would be properly disposed of in accordance with Vandenberg AFB-approved plans developed by ABV program personnel, federal and state regulations, and the Vandenberg AFB Hazardous Waste Management Plan.

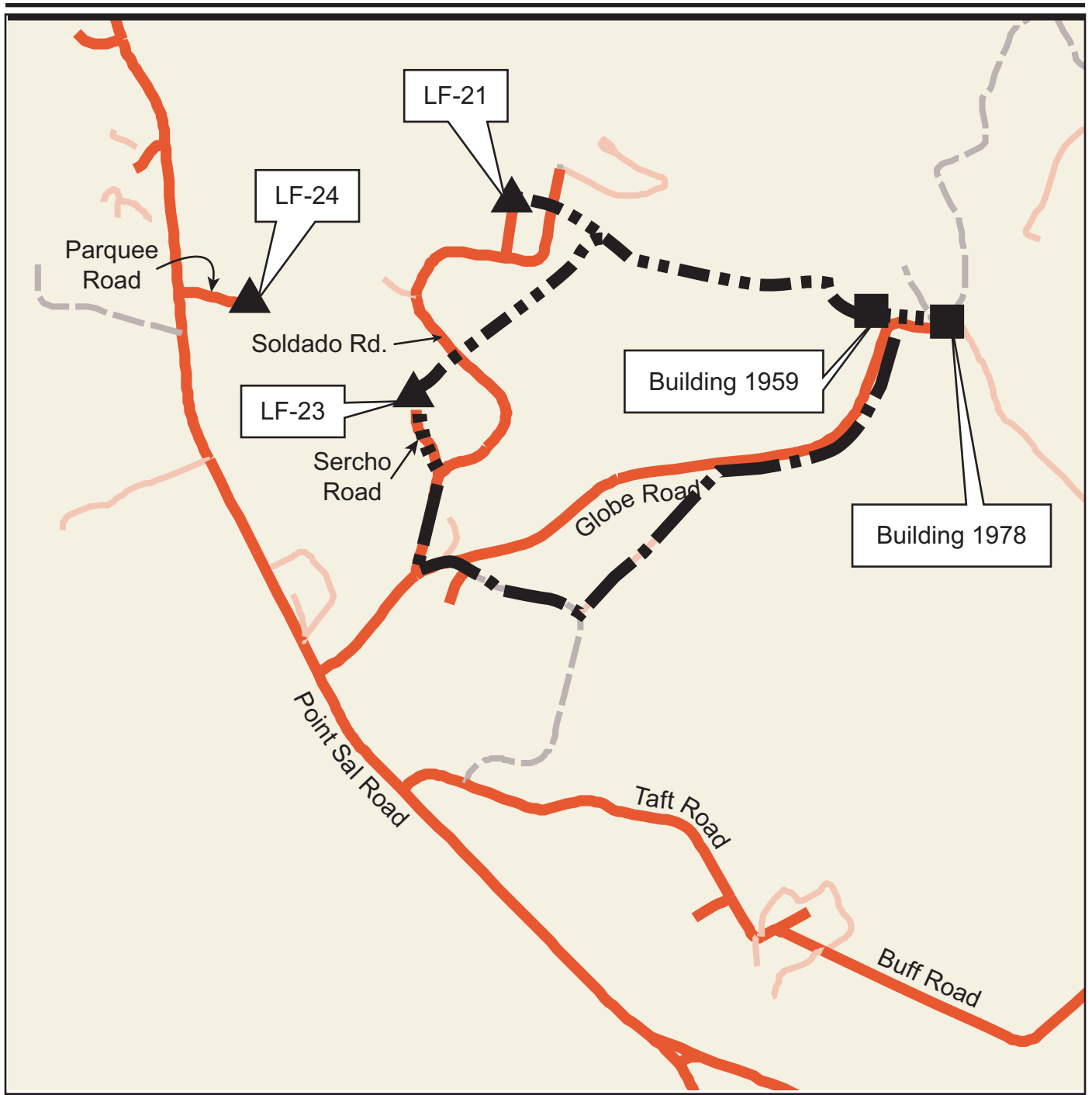
The Silo Interface Vault equipment, which includes environment control systems, power distribution, and command and control interfaces, would be located in the existing underground LER, which surrounds the launch silo and serves as an access to the silo from an underground position. The LER would provide access to the interior of the silo and the side of the missile near its top for connecting and disconnecting utilities, command launch equipment, or other interface needs. The LER would remain unoccupied except to install or remove the interceptor or for maintenance of the launch silo, LER, or other site equipment.

Overhead power would be provided and distributed to LF-23 by Vandenberg AFB. A permitted diesel generator would be used as a backup power source so that a new secondary distribution line would not be required. Area wide lighting, telephone communications, warning lights, and a public address system would also have to be installed at the site. All temporary structures such as concrete footings, equipment towers, and fiber optic and communication cabling would be removed upon completion of the program unless directed otherwise by Vandenberg AFB. The launch silo site would remain unoccupied except to install and remove the missile or for maintenance of the launch silo or other site equipment.

Building 1978 is a previous Minuteman alert facility that is currently used by the GMD Program. Only minor modifications inside the building would be required, so this facility could continue to be used as the LCC for the ABV tests. Building 1959 would require only minor facility modifications to install the required launch support communications equipment.

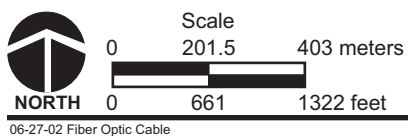
Fiber-optic Cable Installation

Approximately 1.2 to 2 kilometers (0.75 to 1.3 miles) of underground fiber-optic cable would be required to connect LF-23 to the communications facility, Building 1959. The fiber-optic cable would be installed in existing conduit from Building 1959 to the intersection of Soldado Road with Sercho Road, as shown in figure 2-4. From there, new conduit and fiber-optic cable would have to be installed for approximately 256 meters (840 feet) to LF-23. Trenching for the new fiber-optic cable installation would not go below the sub-base of the selected access road. A temporary aboveground fiber-optic cable may be utilized as an interim solution to the underground cable. Approximately 90 meters (300



EXPLANATION

- Existing Fiber Optic Route
- - - New Fiber Optic Route
- · · Temporary Above Ground Fiber Optic Route
- ▲ Launch Facility
- Building



Proposed Fiber Optic Cable Routes

Vandenberg AFB

Figure 2-4

ABV Verification Tests EA

feet) of underground fiber optic cable would also be installed between Buildings 1959 and 1978 by boring underground between the two buildings.

The GMD Project Office would be responsible for the implementation of any required avoidance of cultural resources or mitigation measures assigned to this project as a condition of approval for this activity. These measures may include, but are not limited to, literature searches, having an archaeologist and/or Native American specialist present during site preparation activities, flagging or fencing to protect resources, avoidance of known cultural resource areas, archaeological testing, data recovery, and report preparation. If previously undocumented cultural resource items are discovered during excavation, grading, or other ground-disturbing activities, work would immediately cease. In addition, work would be temporarily suspended within 30 meters (100 feet) of the discovered item until it has been properly evaluated and secured. Any discovery of previously unidentified cultural resources would be reported to the Vandenberg Base Historic Preservation Officer.

2.1.3 PRE-FLIGHT ACTIVITIES

The ABV missile components would be transported separately to Vandenberg AFB by aircraft or by a common carrier truck from locations primarily in Alabama and Utah approximately 4 to 6 weeks before launch. The KV emulator bi-propellant tanks would be filled and then transported over land by truck from the manufacturer. Both transportation methods, by air or road, would be in accordance with DoD and Department of Transportation (DOT) rules and regulations.

Integration and testing of the ABV test units at Vandenberg AFB would be performed in two phases: (1) booster and payload processing at Building 1555 or 1819, and (2) launch processing at LF-23.

Booster and Payload Processing

Building 1555 or 1819 would be used for assembly, test, and storage of the ABV. The facility would be required to be available approximately 6 to 8 weeks before launch. The facility would also be used for storage of miscellaneous equipment.

Following motor delivery at Building 1555 or 1819, all three motor stages would be individually integrated horizontally with installation of avionics, harnessing, ordnance, thrust vector controls, instrumentation, and FTS components. Once vehicle components are in place, electrical system testing would take place to validate proper functioning of the entire launch vehicle system.

Payload processing in Building 1555 or 1819 may include installation of hypergolic fuel and oxidizer propellant tanks onto the KV emulator subassembly, inspection of the KV hypergolic propellant tanks after installation, pressurization of helium into its pressure vessels on the KV emulator, final inspections, and testing and checkout of the loaded KV emulator assembly. Integration of the interceptor and the KV emulator would be performed in Building 1555 or 1819.

Approximately 9 to 14 kilograms (20 to 30 pounds) of monomethylhydrazine and nitrogen tetroxide liquid propellant could be used in the ABV KV. These materials would be contained within the KV emulator (fueled at the manufacturer) and would not be released at the launch site except in the unlikely event that a system leak occurred. Liquid fuels would be handled in accordance with U.S. Air Force regulations. A fully trained hazardous materials response team consisting of GMD contractors and Vandenberg AFB personnel would be located on-site to respond to such an event. The integrated missile would remain at Building 1555 or 1819 until transported to the launch site, where it would be transferred to the missile strongback prior to placement into the silo at LF-23.

Launch Site Processing

After silo placement at LF-23, testing would ensure all missile range systems, communications, and utilities function properly. Applicable federal, state, local, and U.S. Air Force safety regulations would be followed during all pre-launch activities. An appropriate explosive safety quantity-distance (ESQD) would be established and maintained by Vandenberg AFB safety personnel around facilities where missiles or other ordnance are stored or handled in accordance with all applicable DoD and U.S. Air Force regulations. The ESQD to be established around LF-23 would be within the larger one used during Minuteman missile launches, which involved more net explosive weight.

Approximately 20 people would be at the launch site during missile placement and launch preparation for a period of 4 to 6 weeks before each launch. Final enabling operations would be performed manually. Final countdown operations would be controlled from the LCC for ABV flight tests. Immediately prior to the launch there would be 4 to 5 people at the launch site, and 12 people at the LCC. During the launch there would be no one at the launch site, and up to 30 at the LCC. During the periods between ABV tests, three to four government contractor personnel would remain at Vandenberg AFB to prepare the site for the next mission.

2.1.4 FLIGHT ACTIVITIES

The ABV flight tests are currently scheduled for launch from LF-23 beginning in 2003. The 30th Space Wing Safety Office (30 SW/SE) would establish designated areas from which all personnel are cleared based on the potential for missile debris as a result of an accident.

The Flight Safety Analyst from 30 SW/SE would define which airspace areas the Proposed Action would potentially affect, and the Chief of Range Operations would coordinate with the Federal Aviation Administration (FAA) and the U.S. Coast Guard to address any issues of concern.

Following booster processing at Building 1555 or 1819, the booster would be transported to the launch site at LF-23. Vandenberg AFB would be notified and its hazardous operations support contractor would escort the missile to the launch site. The missile would then be lifted and emplaced by crane in the presence of Vandenberg AFB safety

personnel. Final enabling operations would be performed manually. Final countdown operations would be controlled from the LCC, Building 1978, for ABV flight tests.

Blast residue generated by the ABV tests (propellant by-products, paint burned off the silo, and umbilical cables) would be contained within the silo. Hazardous materials used on site would include cleaners, solvents, lubricants, gasoline, and diesel fuel.

Safety Procedures

Launch scenarios would be planned to ensure that debris from a mishap would fall within the WTR and the open ocean area west of Vandenberg AFB. Test mishaps would be defined in terms of three scenarios: missile failure on the launch pad, termination of a flight shortly after liftoff, and termination (controlled and uncontrolled) of a flight after the missile has left the vicinity of the launch pad.

Either a detonation of the booster or an intense fire in which the propellant burns but does not explode would characterize the termination of a flight on the launch pad. An ESQD surrounding the launch pad would be calculated based on the equivalent explosive force of all propellant and pyrotechnic materials contained in the flight vehicle. During all launch activities, provisions would be made in accordance with *Eastern and Western Range (EWR) Range Safety Requirements 127-1*, to maintain a stand-by emergency response team consisting of fire fighting, safety, medical, and bioenvironmental engineering personnel. Established procedures to prohibit access to restricted areas would be followed. The restricted areas are based upon the probability of potential hazards involved with malfunction during test flights and would include:

- The impact limit line, sets the boundary of the protection line for all non-mission-essential personnel
- The launch caution corridor, an area limited to essential personnel
- The launch hazard area (LHA), an area around the launch point limited to essential personnel in hardened facilities (approximately 20 essential personnel in the LCC)
- The stage impact area

The emergency response team would be positioned near the launch site to ensure immediate response and rapid control in the event of an accident. Termination of a flight shortly after liftoff would result in containment of all hazardous debris within the impact limit line. Non-essential mission personnel would be excluded from this area during launch operations.

Areas such as oil rigs and shipping lanes would be verified cleared in accordance with existing Vandenberg AFB standard operating procedures (SOPs). Any debris falling on Vandenberg AFB land would be handled in accordance with Vandenberg AFB emergency response plans.

2.1.5 POST-FLIGHT ACTIVITIES

Minor facility maintenance would occur after each ABV launch to ensure that the launch site would be operational for the next ABV test. After an ABV launch, post-flight procedures would include silo inspection, removal of blast residue, and minor silo refurbishing including minor touch-up painting on the top side of the silo. Approximately four to eight people would be at the launch site for inspection, silo brush down, and refurbishing.

Blast residue would be properly scraped/swept up, collected, and then placed in containers appropriately labeled as hazardous or nonhazardous waste for disposal. If the residue were determined to be hazardous, then it would be disposed of as hazardous waste, according to federal and state regulations and the Vandenberg AFB Hazardous Waste Management Plan. All facility maintenance would be handled in accordance with appropriate federal, state, and local regulations regarding hazardous materials and waste.

2.2 NO-ACTION ALTERNATIVE

The No-action Alternative would be not to perform the ABV testing. Current operations at Vandenberg AFB would continue, and the ABV tests would not be performed at any launch facility on the installation. Under the No-action Alternative, aircraft and carrier trucks would not be required to transport the ABV test missile components, and Building 1555 or 1819 would not be used to integrate the missiles. There would be no modifications to LF-23, and no underground fiber-optic cable would be laid between LF-23 and Building 1959. No changes would be made to Building 1978. No launch control equipment would be installed, and the facility would be left in its existing condition. Current operations at Vandenberg AFB would continue, including the canisterized booster verification testing being performed at LF-21 and the planned launches from 576 E.

2.3 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

A launch corridor of sufficient length is required that will allow performance evaluation of the entire booster configuration in order to properly validate the booster performance. The testing must very accurately replicate the conditions that the booster will experience at its deployment site. Since the missile will be deployed in a silo, testing from a silo is required.

Candidate test locations were examined that could provide the launch facilities and launch corridor in time to meet the Program schedule at a reasonable cost. The examination reduced the candidate sites to Vandenberg AFB; Reagan Test Site (RTS), U.S. Army Kwajalein Atoll; and Cape Canaveral, Florida. No silos exist at Cape Canaveral. Unused Minuteman test silos are available at Vandenberg AFB, while uncompleted silos exist at RTS. Consideration was given to new construction at Cape Canaveral; however, the schedule for an environmental analysis, coupled with the duration for new construction for an entire launch complex ruled out that option. Additionally, an existing test range with

existing sensors and flight safety system is required in order to meet the schedule. Vandenberg AFB and RTS have these assets. Based on the schedule requirements to conduct these tests, the only locations that could reasonably provide the capability and maintain schedule were RTS (by completing the existing silos at Meck Island) and Vandenberg AFB (modifying an existing Minuteman silo). However, the refurbished silo at Vandenberg AFB was eliminated because the silo configuration is for a canisterized missile and the current configuration is for a non-canisterized missile.

While a launch silo capability at RTS could be completed in time to perform the testing, that testing would adversely affect other ongoing testing from Meck Island. Additionally, performing the required trajectories from Meck would require performing significant dog-leg maneuvers, which are: (1) not representative for the booster and (2) more difficult for the booster to perform, so it adds unnecessary risk to the booster flights. Performing the booster validation testing from Vandenberg AFB eliminates the on-site conflicts that would occur with two different activities at Meck Island and provides the clear launch corridor required to adequately validate booster performance. Vandenberg AFB also allows immediate use of existing launch support equipment and software that has been used for previous booster validation flight tests.

2.3.1 ADDITIONAL SITES CONSIDERED ON VANDENBERG AFB

Along with LF-23, three additional alternative LFs were initially evaluated as potential launch sites for the ABV tests: LF-25, LF-24, and LF-07. The LFs are located within proximity to and in an environment similar to that of LF-23.

2.3.1.1 Launch Facility-25

LF-25 is located at the end of Watt Road off of 13th Street on north Vandenberg AFB. This site was a Minuteman II silo launch facility that has since been decommissioned and abandoned in-place. The cost to refurbish LF-25 would far exceed the cost of refurbishing other suitable facilities, and therefore the site is not considered a reasonable alternative for the Proposed Action. In addition, the potential environmental impacts that would be caused by this alternative would be more extensive than those associated with the Proposed Action. Since the silo has been stripped of real property and is overgrown with vegetation, significant site preparation and construction activities would be necessary. Such extensive activities could cause adverse impacts to air quality, biological resources, and solid waste. This site was also eliminated from further study because of an existing adjacent structure.

2.3.1.2 Launch Facility-24

LF-24 is an inactive Minuteman II launch facility located at the end of Parquee Road on north Vandenberg AFB. LF-24 would not be a satisfactory location for the ABV tests because when compared to LF-23, there is more potential for impact to archaeological resources, more refurbishment activities would be required, and longer fiber-optic cable runs would be required; therefore it was eliminated from further study.

2.3.1.3 Launch Facility-07

LF-07 (Building 1981) is located at the end of Armar Road on north Vandenberg AFB. LF-07 is an inactive Minuteman II launch facility. All usable parts have been removed, and the site has been placed in caretaker status. LF-07 would not be a satisfactory location for the ABV tests because of structural damage to the silo and the proximity of protected sites, coastal zones, archaeological resources, and other environmental constraints of the surrounding area; therefore it was eliminated from further study.

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3.0

AFFECTED ENVIRONMENT

3.0 AFFECTED ENVIRONMENT

This section describes the environmental characteristics that may be affected by the Proposed Action at Vandenberg AFB. To provide a baseline point of reference for understanding any potential impacts, the affected environment is concisely described; any components of greater concern are described in greater detail. The EA evaluates the potential environmental impacts of modifying an existing launch silo and related facilities for up to six ABV launches over a 5-year period. The EA also evaluates related activities, such as safety issues associated with transporting, handling, and storage of ABV components, which could have potential impacts on public health and safety or the environment.

Available reference materials, including EAs, EISs, and base master plans, were reviewed. Questions were directed to installation and facility personnel, and private individuals. Site visits were also conducted where necessary to gather the baseline data presented below.

Environmental Resources

Thirteen broad areas of environmental consideration were originally considered to provide a context for understanding the potential effects of the Proposed Action and to provide a basis for assessing the severity of potential impacts. These areas included air quality, airspace, biological resources, cultural resources, environmental justice, geology and soils, hazardous materials and waste, health and safety, infrastructure, land use, noise, socioeconomics, and water resources. These areas were analyzed as applicable for the proposed location or activity.

Based on an initial analysis it was determined that the activities proposed would not result in short- or long-term impacts to airspace or socioeconomics. No new special use airspace, or any modification to existing special use airspace, would be required to support the Proposed Action. Personnel would be drawn from the existing workforce, thus minimizing beneficial impacts to socioeconomics in the affected region. Therefore, these two resource areas were not analyzed further.

Environmental Setting

Vandenberg AFB is located in Santa Barbara County, California, approximately 88 kilometers (55 miles) north of Santa Barbara. The cities nearest to the base are Lompoc, 11 kilometers (7 miles) southeast, and Santa Maria, 27 kilometers (17 miles) northeast. The approximately 400-square-kilometer (154-square-mile) base covers more than 39,660 hectares (98,000 acres) along 56 kilometers (35 miles) of undeveloped Pacific coastline. Vandenberg AFB's climate is Mediterranean, or dry summer subtropical.

3.1 AIR QUALITY

Air quality in a given location is described by the concentrations of various pollutants in the atmosphere, expressed in units of parts per million (ppm), or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Pollutant concentrations are determined by the type and amount of pollutants emitted into the atmosphere; the physical characteristics, including size and topography, of the air basin; and meteorological conditions related to prevailing climate. The significance of a pollutant concentration is determined by its comparison with National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS) that establish limits on the maximum allowable concentrations of various pollutants to protect public health and welfare (table 3-1).

Region of Influence

The region of influence (ROI) for launch site preparation is a circular area with a radius of only several hundred feet centered on the site of activity. The ROI for missile launches encompasses the air basin surrounding Vandenberg AFB.

Affected Environment

The coastal location of the Vandenberg AFB experiences moderate seasonal and daily variation in temperature and humidity. Temperatures are mild, ranging from 4°C to 24°C (39°F to 75°F) with an annual mean temperature of 14°C (58°F). The rainy season extends from November to April. Average annual precipitation is 33 centimeters (13 inches).

An air basin is an area of the state, often comprising several counties, which has been designated as such by the California Air Resources Board based upon similar meteorological and geographic conditions. Vandenberg AFB is located in the South Central Coast Air Basin, which consists of San Luis Obispo, Santa Barbara, and Ventura counties (California Air Resources Board, 2000). With respect to air quality, Santa Barbara County is divided into North County and South County. Vandenberg AFB is located within North County (U.S. Department of the Air Force, 1995).

The State of California has adopted ambient air quality standards that either meet or exceed the NAAQS. The CAAQS are more strict than the NAAQS for ozone, carbon monoxide, sulfur dioxide, particulate matter of 10 microns in diameter or smaller (PM-10), and lead. In addition to the six criteria pollutants covered by the NAAQS, the CAAQS also contain standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility.

According to Environmental Protection Agency (EPA) guidelines, areas with air quality surpassing the NAAQS are designated as being in attainment; areas with a lesser air quality are classified as non-attainment areas. Santa Barbara County is in attainment for all federal air quality standards except ozone and in state non-attainment for both ozone and PM-10. (Santa Barbara County Air Pollution Control District, 2000a;b) The Santa Barbara County Air Pollution Control District (SBCAPCD) is currently seeking redesignation from the California Air Resources Board and the EPA as being in attainment for federal ozone standards (Fredrickson, 2001).

Table 3-1: Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards ¹ Concentration ³	Federal Standards ²	
			Primary ^{3, 4}	Secondary ^{3, 5}
Ozone	1-Hour	0.09 ppm (180 µg/m ³)	0.12 ppm (235µg/m ³) ⁶	Same as Primary Standard
	8-Hour		0.08 ppm (157 µg/m ³)	
Carbon Monoxide	8-Hour	9.0 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)	None
	1-Hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	
Nitrogen Dioxide	Annual Arithmetic Mean	-	0.053 ppm (100µg/m ³)	Same as Primary Standard
	1-Hour	0.25 ppm (470 µg/m ³)	-	
Sulfur Dioxide	Annual	-	0.030 ppm (80 µg/m ³)	-
	24-Hour	0.04 ppm (105 µg/m ³)	0.14 ppm (365 µg/m ³)	-
	3-Hour	-		0.5 ppm (1,300 µg/m ³)
	1-Hour	0.25 ppm (655 µg/m ³)	-	
Respirable Particulate Matter (PM-10)	Annual Geometric Mean	30 µg/m ³	-	Same as Primary Standard
	24-Hour	50 µg/m ³	150 µg/m ³	
	Annual Arithmetic Mean	-	50 µg/m ³	
Fine Particulate Matter	24-Hour	No Separate State Standard	65 µg/m ³	Same as Primary Standard
	Annual		15 µg/m ³	
Lead	30-Day Average	1.5 µg/m ³	-	-
	Calendar Quarter		1.5 µg/m ³	Same as Primary Standard
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m ³)	No federal standards	No federal standards
Vinyl chloride	24-Hour	0.010 ppm (26 µg/m ³)	No federal standards	No federal standards
Sulfates	24-Hour	25 µg/m ³	No federal standards	No federal standards
Visibility Reducing Particles	8-Hour (10 a.m. to 6 p.m. PST)	In sufficient amount to produce an extinction coefficient of 0.23 per km – visibility of 10 miles or more due to particles when the relative humidity is less than 70%.	No federal standards	No federal standards

mg/m³ = milligrams per cubic meter, µg/m³ = micrograms per cubic meter

Notes:

1. California standards for ozone, carbon monoxide, sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, PM-10, and visibility reducing particles are not to be exceeded values. All others are not to be equaled or exceeded.
2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with a maximum hourly average concentration above the standard is equal to or less than one.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25°C and a reference pressure of 760 millimeters of mercury (1,013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
5. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects from a pollutant.
6. New federal 8-hour ozone and fine particulate matter standards were promulgated by the U.S. Environmental Protection Agency (EPA) on July 18, 1997. The federal 1-hour ozone standard continues to apply in areas that violated the standard. Contact EPA for further clarification and current federal policies.

The SBCAPCD administers regulations for non-vehicular air pollution sources, and is required to monitor air pollutant levels to ensure federal and state ambient air quality standards are met or develop a plan to meet them (Air Force Center for Environmental Excellence, 1999). The California Air Resources Board and local air pollution control districts such as SBCAPCD operate more than 200 air monitoring stations in California (State of California Air Resources Board, 2000). Vandenberg AFB has one Prevention of Significant Deterioration air monitoring station, located on South Vandenberg AFB near the Power Plant (Vandenberg Air Force Base, 2002b).

Prior Vandenberg AFB emissions inventory results show that emissions from missile launches, which are considered nonstationary emission sources, accounted for less than 1 percent of the total of PM-10 and 2.3 percent of the total of carbon monoxide. Since 1991, all new stationary sources of emissions (and modifications) at Vandenberg AFB have applied best available current technology and offset emissions at a 1.2 to 1.0 ratio. Therefore, current emissions at Vandenberg AFB, at least for stationary sources, are likely to be similar to prior emissions inventory results.

Vandenberg AFB has used EnviroCom, an air quality database, since 1996 to track sources and inspections, monitor permits, and generate standardized emission reports (Air Force Center for Environmental Excellence, 1999).

3.2 BIOLOGICAL RESOURCES

At Vandenberg AFB, rare species inventories, sensitive habitat protection, maintenance of geographic information system databases of rare and listed species, and threatened and endangered species monitoring, management and protection are the responsibility of the Natural Resources Section of the 30th Civil Engineer Squadron/Environmental Management (30 CES/CEVPN). The Endangered Species Act of 1973 requires the U.S. Fish and Wildlife Service to identify plant and wildlife species that are threatened or endangered. Federal agencies are required to assess the effect of any project on threatened and endangered species under Section 7 of the Endangered Species Act.

Region of Influence

The ROI for biological resources includes the area within and adjacent to the proposed launch facilities, LF-23, as well as Buildings 1959, 1978, 1555, and 1819 (the Missile Assembly Building) located in northern Vandenberg AFB. Much of the ROI is located within areas previously disturbed by launches, mowing, and other activities.

Affected Environment

Vegetation

Fourteen major vegetation and habitat types have been described and mapped on Vandenberg AFB. Among these vegetation types, coastal sage scrub and native and nonnative grasslands are the major communities found in the proposed project area.

The launch facilities proposed for use are located in a grasslands community situated in Vandenberg's northernmost portions. LF-23 is located approximately 1,250 meters (4,100 feet) from the coast. The site is located on a marine terrace in a remote, relatively flat grasslands area, where vegetation consists primarily of grasses and small herbs, such as sea rocket, sand verben, heliotrope, and phacelia (U.S. Department of the Air Force, 1997). In certain areas, the wind force is indicated by the comparatively stunted growth of many floral species (U.S. Department of the Air Force, 1991).

Building 1819 is situated on the San Antonio Terrace, which is located within, and adjacent to, the largest expanse of stabilized sand dunes on Vandenberg AFB (U.S. Department of the Air Force, 1991). Swales (low areas), dune, grassland, and freshwater wetland are all found within this area. Representative plants include coastal lupine, mock heather, cudweed-aster, common phacelia, beach grass, veldt grass, seacliff buckwheat, and sticky monkey flower. (U.S. Department of the Air Force, 1997)

Wildlife

Vandenberg AFB plant communities provide habitat for many resident and migratory animals. The Western fence lizard, garter snake, pocket gopher, California ground squirrel, and deer mouse are typical examples of smaller wildlife species. Also common are brush rabbit, badger, and mule deer. Birds such as ring-billed, Heerman's, and glaucous-winged gulls, as well as the western wood-pewee, rhinoceros auklet, red-winged blackbird, red-tailed hawk, great horned owl, and golden eagle have also been sighted. (U.S. Department of the Air Force, 1997; Vandenberg Air Force Base, 2000a)

The Migratory Bird Treaty Act (16 USC 703-712) protects many species of migratory birds. Specifically, the act prohibits the pursuit, hunting, taking, capture, possession, or killing of such species or their nests and eggs.

Because Vandenberg AFB is near the southern limit of the breeding ranges for many seabird species, a long-term program was begun in 1999 to annually monitor population dynamics and breeding biology of seabirds breeding on Vandenberg AFB. An estimated total of 1,200 seabirds were indicated that year. (Point Reyes Bird Observatory, 1999)

The loggerhead shrike (*Lanius ludovicianus*) and the western burrowing owl (*Speotyto cunicularia hypugea*) could potentially be present in the project area. Both species are listed as federal special concern species as well as California Species of Concern.

The Marine Mammal Protection Act (16 USC 1361, et seq.) gives the U.S. Fish and Wildlife Service and National Marine Fisheries Service co-authority and outlines prohibitions for the taking of marine mammals. A take would result from an attempt to harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill any marine mammal. Subject to certain exceptions, the act establishes a moratorium on the taking and importation of marine mammals. Exceptions to the taking prohibition allow U.S. Fish and Wildlife Service and National Marine Fisheries Service to authorize the incidental taking of small members of marine mammals in certain instances.

The Pacific harbor seal (*Phoca vitulina*) is a resident species of Point Sal, located approximately 7 kilometers (4.5 miles) from LF-23. Counts of harbor seals performed at nine main haul out sites along the coast of Vandenberg AFB average 327 seals. During recent surveys conducted in March and April 2002, a new harbor seal haul-out site was discovered that is regularly used by harbor seal mothers and their pups. This site, designated as Lion's Head, is approximately 2.0 kilometers (1.2 miles) from LF-23. The largest number of harbor seals are found at Lion's Head between September and January. Most harbor seal pupping occurs in March with a 4- to 6-week weaning period. (Vandenberg Air Force Base, 1999)

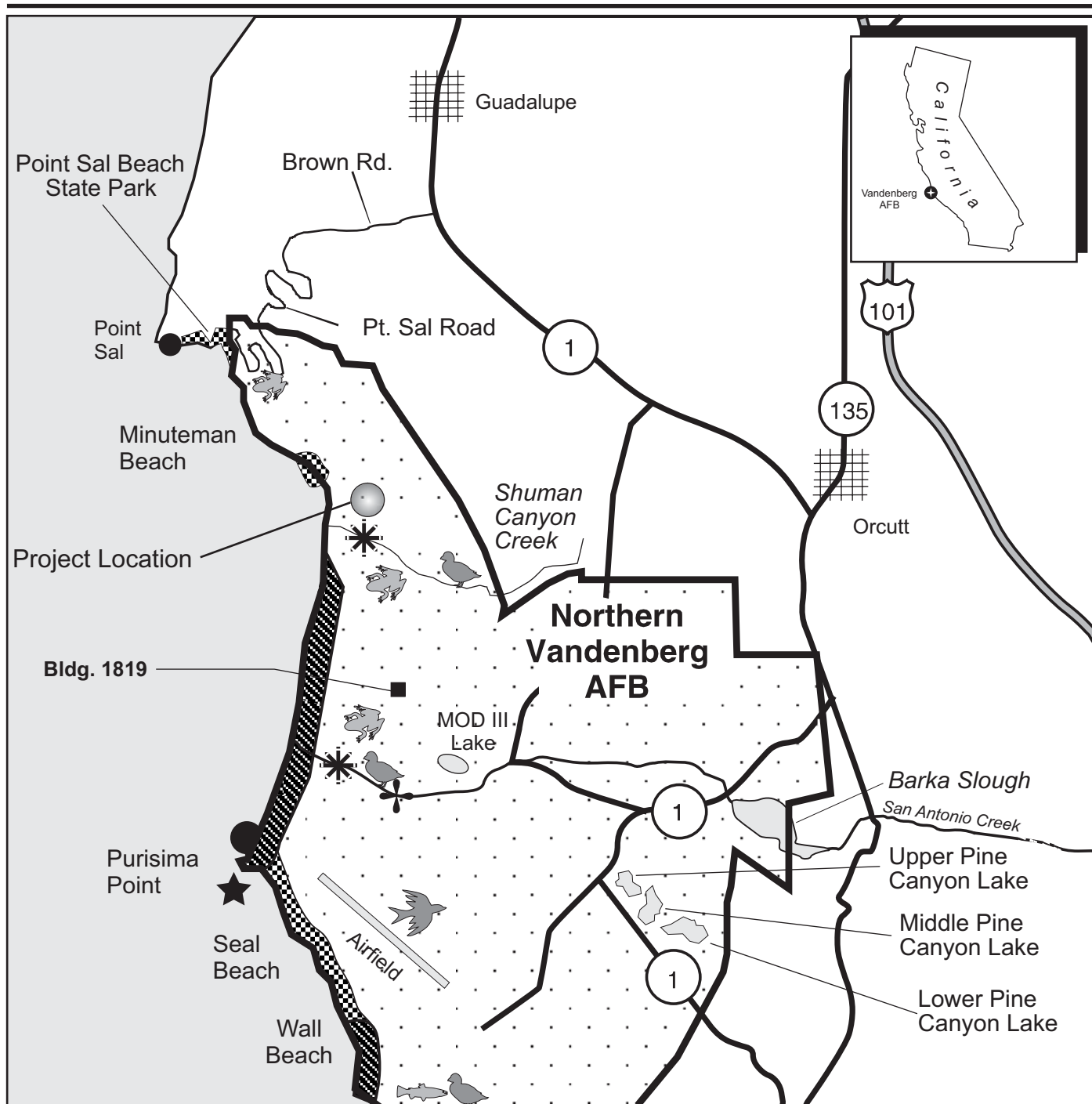
The California sea lion (*Zalophus californianus californianus*) does not breed on Vandenberg AFB, but is found along the coastline during the summer (Vandenberg Air Force Base, 1999). Point Sal, which is north of the Base boundary, is the closest area used as a haulout by the California sea lion. Other pinnipeds such as the elephant seal and northern fur seal are observed periodically on the base and can be found in nearby haulout/rookery areas, preferring undisturbed sections of mainland coast and offshore islands or rocks. One such area is just south of Minuteman Beach, which is approximately 3 kilometers (2 miles) from the proposed launch site.

The Magnuson-Stevens Fishery Conservation and Management Act requires that federal agencies consult with the National Marine Fisheries Service on activities that could harm Essential Fish Habitat areas. Essential Fish Habitat includes those waters and substrate (sediment, hard bottom) necessary to the complete life cycle of fish, from spawning to maturity. The east-west boundary for coastal pelagic species (Pacific sardine and mackerel, northern anchovy, jack mackerel, and squid), groundfish (including species of rockfish, shark, and cod), and highly migratory fish (tunas, marlin, and swordfish) includes all marine and estuary waters from the coast of California to the limits of the Exclusive Economic Zone (the 322-kilometer [200-mile] limit) where the United States has exclusive authority over fishing management. Fishing regulations are enforced by Vandenberg AFB security police game wardens.

Threatened and Endangered Species

Vandenberg AFB's diverse habitats support a wide variety of listed species. Those with the potential to occur within the ROI are shown in figure 3-1 and table 3-2.

The four known locations of Lompoc yerba santa (*Eriodictyon capitatum*), a federal endangered plant species, occur in western Santa Barbara County. Two of these locations, composed of three groups, are on Vandenberg AFB approximately 12 kilometers (7 miles) south of the launch site. This plant is associated with the central maritime (Burton Mesa) chaparral and bishop pine forest, which are threatened habitat types with limited distribution. (U.S. Environmental Protection Agency, 2001)



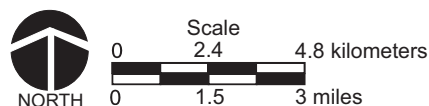
EXPLANATION

- | | | |
|--|---|---|
| Nesting Location of California Least Tern/ Western Snowy Plover | Tidewater Goby | California Least Tern Foraging Areas |
| Haulout Location of California Sea Lion, Northern Elephant Seal, and Pacific Harbor Seal | Unarmored Threespined Stickleback | California Red-legged Frog (Wide Distribution Also Includes Ponds and Vernal Pools) |
| | Roosting Location of California Brown Pelican | Steelhead Trout |
| | Southern Sea Otters | Mountain Plover (Winters Only) |
| | Building | |

Sensitive Habitat for Listed Wildlife Species on Vandenberg AFB

Northern Vandenberg AFB

Figure 3-1



06-27-02 Sensitive Habitat ABV

ABV Verification Tests EA

**Table 3-2: Listed Species Known or Expected to Occur in the Vicinity of
the Proposed Action**

Scientific Name	Common Name	Status	
		State	Federal
Fish			
<i>Eucyclogobius newberryi</i>	Tidewater goby	E	E
<i>Gasterosteus aculeatus williamsoni</i>	Unarmored threespine stickleback	E	E
Amphibians			
<i>Rana aurora draytoni</i>	California red-legged frog	CSC	T
Birds			
<i>Charadrius alexandrinus nivosus</i>	Western snowy plover	CSC	T
<i>Pelecanus occidentalis californicus</i>	California brown pelican	E	E
<i>Sterna antillarum browni</i>	California least tern	E	E
Mammals			
<i>Enhydra lutris nereis</i>	Southern sea otter	T	T
Plants			
<i>Eriodictyon capitatum</i>	Lompoc yerba santa	R	E
<i>Hemizonia increscens</i> ssp. <i>villosa</i>	Gaviota tarplant	E	E

Source: Vandenberg Air Force Base, 1996; U.S. Fish and Wildlife Service, 2001.

NOTES:

CSC	California Species of Concern	R	Rare
E	Endangered	T	Threatened

Status Definition

California Species of Concern—Native species or subspecies that have become vulnerable to extinction because of declining population levels, limited ranges, or rarity. The goal is to prevent these from becoming endangered by addressing the issues of concern early enough to secure long-term viability.

The U.S. Fish and Wildlife Service has listed the Gaviota tarplant (*Hemizonia increscens* ssp. *villosa*) as endangered. It occurs within a narrow band of coastal terrace grassland between Gaviota and Santa Barbara (U.S. Environmental Protection Agency, 2001), southeast of LF-06 (Vandenberg Air Force Base, 2000a). It has recently been identified as occurring in two locations on Vandenberg AFB south of and along Point Sal Road (U.S. Department of the Air Force, 1999).

A resident population of federally threatened southern sea otters (*Enhydra lutris nereis*) has been observed off Purisima Point, typically foraging and rafting in kelp beds; however, semi-migratory individuals may be found all along the coastline. Breeding and pupping have only been observed in the Purisima Point area (Vandenberg Air Force Base, 1999). Otters found near the Point Sal area (Friends of the Sea Otter, 2002) are the nearest to the proposed launch site.

The California brown pelican (*Pelecanus occidentalis californicus*), a federal and state endangered subspecies, and the western snowy plover (*Charadrius alexandrinus nivosus*),

a federal threatened shorebird, are commonly observed in the Vandenberg AFB area, which provides winter roosting for the former and nesting and roosting sites for the latter (U.S. Department of the Air Force, 1991). The pelicans roost at Point Sal, northwest of LF-23, and nesting plovers are located in coastal areas considerably south of the proposed launch site. California brown pelicans and western snowy plovers are also known to use areas near Purisima Point.

San Antonio Creek, located south of Building 1819, is one of the largest streams on base. Several freshwater marshes have been recorded along the San Antonio that, along with the creek itself and the lagoon at its mouth, are frequented by both common and rare Vandenberg species (U.S. Department of the Air Force, 1991); the unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), a federal and state endangered fish, and the tidewater goby (*Eucyclogobius newberryi*) can be found there. This may represent the northern limit for the unarmored threespine stickleback, which uses adjoining feeder streams during the wet season (Pacific Pipeline System, Inc., 1996).

The federally threatened California red-legged frog (*Rana aurora draytoni*) is located in the San Antonio Creek and the man-made Mod III Lake located south of Building 1819 on the southern edge of San Antonio Terrace. This lake's fish, such as *gambusia*, are all introduced species. The California red-legged frog is found in surrounding riparian areas, as well as in freshwater ponds neighboring the area and Barka Slough. The California red-legged frog is also found in riparian wetland areas in the northwestern Vandenberg AFB portion near Minuteman Beach, and shows a preference for freshwater pools and ponds associated with arroyo willow, cattails, and other thickets of emergent aquatic vegetation. (U.S. Department of the Air Force, 1997) In March 2001, the U.S. Fish and Wildlife Service designated 1.6 million hectares (4.1 million acres) in 28 California counties as critical habitat for the threatened California red-legged frog, but excluded Vandenberg AFB since its integrated natural resource management plan provided adequate management for the on-base population (Jumping Frog Research Institute, 2001).

Historical sightings of the recently federally delisted and state endangered American peregrine falcon (*Falco peregrinus*) in the Point Sal area have been reported (Vandenberg Air Force Base, 1999). This raptor has been the subject of an active state reintroduction program since the 1970s (U.S. Department of the Air Force, 1990).

Environmentally Sensitive Habitat

The installation envelops one of the major southern California dune systems, with areas still resembling their original condition, and occupies one of the state's six remaining coastal dune systems. Extensive central foredunes and coastal dune scrub are located on the North Vandenberg coast (U.S. Department of the Air Force, 1991).

Along with a network of swales, several wetlands (including two man-made) occur near Building 1819; the closest is approximately 1.6 kilometers (1 mile) to the northwest. These wetlands, ranging between 0.8 and 2.8 hectares (2 and 7 acres) in size, support such typical species as arroyo willow, wide-leaf cattail, California bulrush, water smartweed, and bog rush.

3.3 CULTURAL RESOURCES

Cultural resources include prehistoric and historic sites, structures, districts, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or any other reason. Cultural, archaeological, and paleontological resources are limited, nonrenewable resources whose potential for scientific research (or value as a traditional resource) may be easily diminished by actions impacting their integrity.

Numerous laws and regulations require that possible effects to cultural resources be considered during the planning and execution of federal undertakings. These laws and regulations stipulate a process of compliance and consultation, define the responsibilities of the federal agency proposing the action, and prescribe the relationship among other involved agencies (e.g., State Historic Preservation Officer, the Advisory Council on Historic Preservation). In addition to NEPA, the primary laws that pertain to the treatment of cultural resources during environmental analysis are the National Historic Preservation Act (especially Sections 106 and 110), the Archaeological Resources Protection Act, the Antiquities Act of 1906, the American Indian Religious Freedom Act, and the Native American Graves Protection and Repatriation Act.

Region of Influence

The term ROI is synonymous with the "area of potential effect" as defined under cultural resources regulations, 36 CFR 800.16(d). In general, the ROI for cultural resources encompasses areas requiring ground disturbance (e.g., areas of new facility/utility construction) and all buildings or structures requiring modification, renovation, demolition, or abandonment. The currently defined ROI for the Proposed Action includes construction sites and any other areas where ground disturbance could occur (e.g., utility corridors, roads).

Affected Environment

Prehistoric and Historic Archaeological Resources

Numerous archaeological surveys at Vandenberg AFB have identified more than 2,000 prehistoric and historic cultural sites. Prehistoric sites include dense shell middens, stone tools, village sites, stone quarries, and temporary encampments. Historic artifacts include those typically used in mission establishment, ranching, and military activities (U.S. Department of the Air Force, 1998). Cultural resource sites located in this area include the site of the former Rancho Guadalupe, which dates from the mission period.

Historic Buildings and Structures

In 1941, the U.S. Army in support of the World War II effort acquired much of the area. Named Camp Cooke, the area served as a training area for armored and infantry units. In 1950 the base was re-activated in support of the Korean War. In 1957, the U.S. Air Force took over the northern 26,305 hectares (65,000 acres) of Camp Cooke and renamed it

Cooke Air Force Base. In 1958, the Strategic Air Command took control of the base and renamed it Vandenberg AFB. (Vandenberg Air Force Base, 2002)

Vandenberg AFB has primarily been used to develop several types of intermediate and long-range ballistic missiles and has been largely associated with the launch of military and civilian payloads since the mid-1950s. The 30 SW is currently the host command at Vandenberg AFB and controls the WTR, which conducts military and civilian space and missile launch operations (U.S. Department of the Air Force, 1998).

Native Populations/Traditional Resources

At the time of European contact, the Vandenberg AFB area was occupied by inhabitants who spoke one of the major languages of the Chumashan branch of the Hokan language family. Several villages were located in the area that is now northern Vandenberg AFB.

It was not until the mid-1700s that the Spanish began to colonize the area and establish missions. In 1901, the Chumash received 30 hectares (75 acres) of reserved land from the U.S. Government which is presently the only land held by the Chumash people. This reservation is located approximately 32 kilometers (20 miles) east of Vandenberg AFB. The base has maintained a cooperative relationship with the Chumash reservation for several years.

Several Chumash-related traditional resources sites have been found at Vandenberg AFB including villages and campsites, rock art panels, and burial grounds (U.S. Department of the Air Force, 1998). Among these is Turtle Pond on the San Antonio Terrace, which is considered to be a traditional resource area by the Santa Ynez Band of Mission Indians (Chumash) (U.S. Department of the Air Force, 1997).

Paleontological Resources

The Miocene Monterey Formation and Later Miocene (13 to 25 million years before present) deposits identified at northern Vandenberg AFB have yielded imprints of algae, fish fragments, coprolite, and whalebone. Fossils of both vertebrate and invertebrate animals have been found in the vicinity of Vandenberg AFB (U.S. Department of the Air Force, 1998).

3.4 GEOLOGY AND SOILS

Geology and soils include those aspects of the natural environment related to the earth, which may affect or be affected by the Proposed Action. These features include physiography, geologic units and their structure, the presence/availability of mineral resources, soil condition and capabilities, and the potential for natural hazards.

Region of Influence

The ROI for impacts to geology and soils includes the areas 0.8 kilometer (0.5 mile) in radius from project areas affected by construction and operation activities where a natural or geologic hazard could occur as a result.

Affected Environment

Geology

The proposed launch site is located in the northern portion of Vandenberg AFB within the northwest-southeast trending Casmalia Hills, which are underlain by unconsolidated sedimentary rocks. Steep rounded northwest-southeast trending slopes best visually characterize the area and drain northeast into the Santa Maria Valley and southwest into the Pacific Ocean. Elevation varies within the Casmalia Hills from sea level along the coast to 500 meters (0 to 1,650 feet) above sea level at Mount Lospe near the base's northern boundary. (U.S. Department of the Air Force, 1999)

Soils

Soil layers at Vandenberg AFB are primarily made up of sand deposits and are generally shallow with thickness ranging between 0 and 1 meter (0 and 3 feet) (U.S. Army Space and Strategic Defense Command, 1994). The soil within the ROI is classified as Tierra loam, which is well drained loam with rapid to very rapid surface runoff (U.S. Department of the Air Force, 1999).

Erosion hazards are slight to high depending on slope and vegetative cover, with steeper slopes exhibiting a higher potential for erosion (U.S. Army Space and Strategic Defense Command, 1994). Developed slopes are often strategically stabilized to prevent erosion (U.S. Department of the Air Force, 2000). Presently no soils on Vandenberg AFB have been identified by the U.S. Department of Agriculture as prime farmlands (U.S. Department of the Air Force, 2000).

3.5 HAZARDOUS MATERIALS AND HAZARDOUS WASTE

In general, hazardous substances (materials) and wastes are defined by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 USC 9601-9675), the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA) (42 USC 6901-6992), and Title 22 of the California Code of Regulations, as those substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, would present substantial danger to public health and welfare or to the environment when released into the environment.

Several regulatory agencies (e.g., EPA, Occupational Safety and Health Administration [OSHA], and DOT) have differing definitions of a "hazardous material" as applied to a specific situation. Of these definitions, the broadest and most applicable is the definition specified by the DOT for regulation of the transportation of these materials. As defined by

the DOT, a hazardous material is a substance or material that is capable of posing an unreasonable risk to health, safety, or property when transported in commerce and has been so designated. Solid waste materials are defined in 40 CFR 261.2 as any discarded material (i.e., abandoned, recycled, or “inherently waste-like”) that is not specifically excluded from the regulatory definition. This waste can include materials that are solid, liquid, and gaseous (but contained). Hazardous waste is further defined as any solid waste not specifically excluded, which meets specified concentrations of chemical constituents or has certain toxicity, ignitability, corrosivity, or reactivity characteristics.

Executive Order 12088, *Federal Compliance with Pollution Control Standards*, as amended, under the authority of EPA, ensures that necessary actions are taken for the prevention, management, and abatement of environmental pollution from hazardous materials or hazardous waste caused by federal facility activities. The State of California has been delegated authority by EPA for regulation of all activities related to the management of hazardous wastes previously regulated by EPA. California has adopted and elaborated the requirements found in the federal regulations, which are rewritten in Title 22 of the California Code of Regulations.

Existing information on hazardous materials and waste was obtained by reviewing the Vandenberg AFB *Hazardous Waste Management Plan* (Vandenberg AFB, 2000b) and spill contingency plan.

Region of Influence

The ROI for potential impacts related to hazardous materials and waste would be limited to locations within the northern portion of Vandenberg AFB used for ABV pre-launch preparation, launch and post-launch activities. These locations include LF-23, and Buildings 1819, 1555, 1959, and 1978.

Affected Environment

Hazardous Materials Management

30th Space Wing Commander (30 SW/CC) is responsible for the management of hazardous materials and waste at Vandenberg AFB. Due to the diversity in missions performed at Vandenberg AFB, a wide variety of hazardous material types and quantities are in use. Use of hazardous materials must conform to DoD, U.S. Air Force, and other federal hazardous materials management requirements. Vandenberg AFB requires all contractors and organizations using hazardous materials on base to submit an Environmental Protection Plan (EPP) to the Contracting Officer before starting any work. The EPP outlines the methods and procedures to be used by the contractor to maintain air and water quality, protect cultural and natural resources and transport, use, dispose or recycle/reuse/recover materials. The EPP includes a hazardous materials spill contingency plan and Storm Water Pollution Prevention Plan, if necessary. Hazardous materials obtained from off base suppliers are coordinated through Vandenberg AFB's Hazmart Pharmacy. A base supply contractor runs the Hazmart Pharmacy and inventories all hazardous materials, whether purchased by the U.S. Air Force or its contractors. Before releasing hazardous materials to the user, the base supply contractor prepares a printed copy of the Material Safety Data

Sheet and provides it to the user. Hazardous materials are tracked by EnTrack® System personnel within Vandenberg's Logistic Group. Such hazardous materials fall into two basic use categories: materials used in base maintenance activities and those used in various missile test operations, including fuels, oxidizers, and cleaners.

The use of all hazardous materials is subject to ongoing inspection by Vandenberg AFB personnel to ensure compliant waste and material handling processes. The majority of these materials are consumed in operational processes, leaving the remainder to be collected as hazardous waste.

Typical hazardous materials used in base maintenance activities include various cleaning solvents (chlorinated and non-chlorinated) fluids, paints, pesticides, motor fuels, and other petroleum products. These materials arrive at Vandenberg AFB by typical freight delivery routes (truck, rail, air).

Range testing operations, such as missile launches, also employ a wide variety of hazardous materials. Cleaning solvents (chlorinated and non-chlorinated), chlorinated fluorocarbons, various painting compounds, explosive materials, oxidizers, and toxic propellants are typical examples, though their types and quantities vary depending upon specific system and test configuration requirements. Hazardous materials used in conjunction with these programs are brought on base by the agency responsible for testing the individual systems. Each agency utilizing Vandenberg AFB is responsible for procurement, distribution, and management of its hazardous materials, which must conform to the requirements of Vandenberg AFB hazardous material management procedures.

Users of hazardous materials are responsible for safe storage and handling, and for the cost of proper collection and disposal of any potential hazardous waste generated as a result of their on-base activities. The 30th Civil Engineering Squadron Environmental Management Flight (30 CES/CEV) is responsible for the preparation and submittal of spill reports to the appropriate regulating/government agency. Persons assigned to hazardous waste management units on Vandenberg AFB, including the Temporary Accumulation Area, Satellite Accumulation Point, Collection Accumulation Point and Consolidated Collection Accumulation Point are responsible for completing the internal forms used by Vandenberg AFB and for immediately reporting spills/releases in their assigned areas to 30 CES/CEV. The Vandenberg AFB Spill Prevention Control and Countermeasures Plan establishes responsibility, outlines personnel duties, and provides resources and guidelines for use in the control, clean-up, and emergency response for spills/releases.

Hazardous Waste Management

Vandenberg AFB is classified as a large quantity generator, generating approximately 770 to 910 metric tons (850 to 1,000 tons) of hazardous waste yearly as a result of ballistic missile and space launch missions. The California Environmental Protection Agency Department of Toxic Substances Control regulates hazardous wastes at Vandenberg AFB under the California Health and Safety Code, Sections 25100 through 67188. These regulations require that wastes be handled, stored, transported, disposed, or recycled

according to defined procedures. The Vandenberg AFB *Hazardous Waste Management Plan* outlines the procedures to be followed for hazardous waste disposal (Vandenberg AFB, 2000b). The CERCLA process requires its own waste management plan, very similar to the base plan except that storage and onsite disposal is not regulated by RCRA.

Hazardous wastes generated during Vandenberg AFB activities are initially collected at the point of generation and, if not reused or recycled, transported to the consolidated Collection Accumulation Point managed by the base Environmental Compliance Programs Office in Civil Engineering. Here it is containerized and segregated by type. Following initial containerization, waste must be removed from the consolidated Collection Accumulation Point within 90 days, at which time all hazardous waste must be transported to a permitted off-site Treatment, Storage, and Disposal Facility. The Defense Logistics Agency is responsible for the disposal of hazardous waste generated on Vandenberg AFB. This agency has delegated the responsibility to the Defense Reutilization and Marketing Service. The Defense Reutilization and Marketing Service, through a local Contracting Officer Technical Representative, oversees disposal activities at Vandenberg. A Collection Accumulation Point Contract Operator, as an agent to Defense Reutilization and Marketing Service, is responsible for receipt and storage of specified hazardous wastes, and for arranging the removal of hazardous wastes to the off-site disposal facilities.

3.6 HEALTH AND SAFETY

Health and safety includes consideration of any activities, occurrences, or operations that have the potential to affect one or more of the following:

The well-being, safety, or health of workers—Workers are considered to be persons directly involved with the operation producing the effect or who are physically present at the operational site.

The well-being, safety, or health of members of the public—Members of the public are considered to be persons not physically present at the location of the operation, including workers at nearby locations who are not involved in the operation and the off-base population. Also included within this category are hazards to equipment, structures, flora, and fauna.

Region of Influence

The ROI for health and safety of workers includes the immediate work areas, ABV pre-launch preparation sites, the launch site, and the flight corridor. The ROI for public safety includes locations off base that may require evacuation such as the flight corridor or any bordering areas that have the potential to be impacted by the Proposed Action.

Affected Environment

Vandenberg AFB is involved in the ongoing test and evaluation of various missiles, with safe procedural practices as a primary objective. To accomplish this, an aggressive safety evaluation and control system has been implemented, based on more than 40 years experience in test and evaluation.

Health and safety requirements on Vandenberg AFB include industrial hygiene and ground safety. Industrial hygiene is the joint responsibility of Bioenvironmental Engineering, 30 SW/SE, and contractor safety departments. Responsibilities include monitoring contract and base worker exposure to workplace chemicals and physical hazards, hearing and respiratory protection, medical monitoring of contractor and base workers subject to chemical exposures, and oversight of all hazardous or potentially hazardous operations.

Ground safety includes protection from hazardous situations and hazardous materials. If personal protective equipment must be used, safety requires a general description of the commodity in use; the hazardous qualities of the material; and data showing compliance with allowable limits for airborne vapors for workplace, workplace emergencies, and public exposures.

Proposed on-base program operations must receive prior approval, accomplished by the user through presentation of the program via an EPP to 30 CES/CEV through the Contracting Officer. All safety analyses, SOPs, and other safety documentation applicable to those operations affecting Vandenberg AFB or the WTR and its controlled range space must be provided, along with an overview of mission objectives, support requirements, and schedule. The 30 CES/CEV evaluates this information, ensuring that all WTR safety requirements are met.

The 30 SW/CC, Chief of Safety, Flight Safety Analysis, and Mission Control Officer are responsible for ensuring safety during ballistic and space launches at Vandenberg AFB. Responsibility and final authority of the safe conduct of ballistic and space vehicle operations on the Western Range lies with the 30 SW/CC. Establishing and managing the overall safety program at Vandenberg AFB is the responsibility of the 30 SW/SE. (U.S. Department of the Air Force, 1999)

Prior to missile flight operations, the performance of all missiles is evaluated by 30 SW/SE. For operations such as missile flights, that may involve ground impact of objects within the range, an evaluation is made to ensure that populated areas, critical range assets, and civilian property susceptible to damage are outside predicted impacts limits. A Notice to Mariners and a Notice to Airmen are published and circulated in accordance with established procedures to provide warning to personnel (including recreational users of the range space and controlled sea areas) concerning any potential impact areas that should be avoided. Radar and visual sweeps of hazard areas are accomplished immediately prior to operations to ensure evacuation of non-critical personnel.

Vandenberg AFB possesses significant emergency response capabilities that include its own Fire Department, Disaster Control Group, and Security Police Force, in addition to contracted support for handling accidental releases of regulated, hypergolic propellants and other hazardous substances. The Readiness Flight (30 CES/CEX) manages the overall base emergency response program and is responsible for developing and updating the Vandenberg AFB Hazardous Material Emergency Response Plan. Additionally, the 30 CES/CEX chairs the Hazardous Materials Planning Team, ensures that follow-on elements of the Disaster Control Group are assembled as required by the On-Scene Commander in the event of a release response, and maintains training certificates for spill response team members. (Vandenberg Air Force Base, 1999)

The Vandenberg AFB Fire Department approves and maintains the business plans and hazardous material inventories prescribed by the California Health and Safety Code, which are developed by organizations assigned to or doing business on the base. This information can be retrieved electronically in the event of an emergency. Additionally, the Vandenberg AFB Fire Department conducts onsite facility inspections, as required, to identify potentially hazardous conditions that could lead to an accidental release. The Fire Department is advised of all operations involving the transfer of hypergolic propellants on the base. During launch operations, Fire Department response elements are pre-positioned to expedite response in the event of an anomaly. (Vandenberg Air Force Base, 1999)

3.7 INFRASTRUCTURE

Infrastructure addresses transportation routes and those facilities and systems that provide power, water, wastewater treatment, and the collection and disposal of solid waste.

Region of Influence

The ROI includes the transportation routes leading to Vandenberg AFB, over which the ABV components are to be transported and utility systems in the northern part of Vandenberg AFB that could potentially be affected by the Proposed Action.

Affected Environment

Transportation

Roadways. U.S. 101 provides access to Vandenberg AFB and connects the base with San Francisco to the north and Santa Barbara to the south. State Routes 1, 135, and 246 connect the base to U.S. 101.

Many of the personnel and employees of Vandenberg AFB live within the suburban areas of Santa Barbara County and in the cities of Lompoc, Santa Maria, Guadalupe, Buellton, Solvang, and Santa Barbara. Primary access roads to the base also include Santa Lucia Canyon Road, and Central Avenue (U.S. Department of the Air Force, 1998).

Building 1819 can be accessed by New South Road, Building 1555 by Talo Road, LF-23 by Sercho Road, and Buildings 1978 and 1959 by Globe Road (figures 1-1 and 2-4).

Railways. Railway service is provided to the cities of Santa Maria, Lompoc, Santa Barbara, San Luis Obispo, and Ventura by Southern Pacific, Santa Maria Valley, and the Ventura County Railroad companies. Branch lines connect Vandenberg AFB to the Southern Pacific Main Line.

Passenger and freight trains frequently travel through Vandenberg AFB. Vandenberg AFB maintains a strict policy of not launching over trains due to the potential risk to people and property, which is implemented by close communication between the base and train engineers (U.S. Department of the Air Force, 1998).

Airports. There are four airports within the surrounding area of Vandenberg AFB. These include Santa Barbara Municipal, Santa Ynez, Lompoc, and Santa Maria Public airports. Vandenberg AFB also maintains its own runway, which is capable of handling large aircraft (U.S. Department of the Air Force, 1997).

Utilities

Water. Water for Vandenberg AFB is primarily purchased from the Central Coast Authority of the State Water Project and supplied by the San Antonio Aquifer and the Lompoc Terrace Groundwater Basin. In times when the State Water Project's supply cannot meet base demand, purchased water is supplemented by four groundwater wells in the San Antonio well field. (Vandenberg Air Force Base, 2002)

Wastewater. The Lompoc Regional Waste Water Treatment Plant provides wastewater assistance to the city of Lompoc, Vandenberg AFB, and some of the surrounding areas. The capacity of the plant is limited to 19 million liters (5 million gallons) per day and operates at approximately 13 million liters (3.5 million gallons) per day. In 1996, the plant treated approximately 5 million liters (1 million gallons) per day of wastewater from Vandenberg AFB (U.S. Department of the Air Force, 1998).

Solid Waste. The Class III landfill on Vandenberg AFB is maintained by a contractor. Santa Barbara County maintains four off-base landfills, three transfer stations, and a proposed Materials Recovery Facility. Of these, Vandenberg AFB primarily uses its own landfill located on the northern part of the base. The base also uses the Lompoc and Tajiguas landfills. (U.S. Department of the Air Force, 1998)

Electricity. Electricity for Vandenberg AFB is supplied by Pacific Gas and Electric Company's Morro Bay plant to the base's main substation and then distributed throughout the base. Diesel-powered generators are also used to support technical facilities. The base used approximately 452 megawatt hours per day in 1995 (U.S. Department of the Air Force, 1998).

3.8 LAND USE

Region of Influence

The ROI for land use includes all proposed sites and locations on base that may have the potential to be impacted (for example, through restricted access) by proposed activities.

Affected Environment

Vandenberg AFB, located in western Santa Barbara County in south central California, is approximately 88 kilometers (55 miles) northwest of Santa Barbara, and 225 kilometers (140 miles) northwest of Los Angeles. Numerous communities, such as Lompoc, Casmalia, Guadalupe, Santa Maria, Orcutt, Mission Hills, and Vandenberg Village, are located less than 16 kilometers (10 miles) from the base, but are separated by wide buffers of agricultural areas. The county's predominant land uses are agriculture and natural forest. A Federal Correctional Institution is adjacent to Vandenberg Village and along the eastern base boundary.

Approximately 33 percent of the base has been disturbed, leaving the remainder in its natural state. The installation is bounded on the west by 56 kilometers (35 miles) of Pacific Ocean coastline, and occupies approximately 6 percent of the county's total land area. The composition of base land uses consists of residential, commercial, industrial, service, and administrative activities, requiring 340 kilometers (520 miles) of roads, 27 kilometers (17 miles) of railroad tracks, and approximately 1,000 buildings. (U.S. Department of the Air Force, 1997)

In order to document and classify various land use types to establish and maintain Vandenberg AFB's natural resources and serve as a guide for multiple-use/sustained-yield management, a base land management plan has been developed. In addition to these guidelines, various U.S. Air Force safety regulations, such as the Range Safety Requirements, EWR 127-1, and the Vandenberg AFB Comprehensive Plan, restrict on-base development, as do several state and federal regulations designed to preserve cultural, historical, and environmental integrity. (U.S. Department of the Air Force, 1997)

The installation is divided into northern and southern regions by the Santa Ynez River and West Ocean Avenue. Most development is on North Vandenberg AFB and consists primarily of administrative, industrial, and residential facilities. Launch complexes include the former facilities for Peacekeeper and Minuteman intercontinental ballistic missiles. Land use in the area adjacent to the northern boundary of the base is predominantly dedicated to grazing of livestock. (U.S. Department of the Air Force, 1997)

Coastal Zone Management

A federal activity in or affecting a coastal zone requires preparation of a Coastal Zone Consistency Determination by the proponent in coordination with the Vandenberg AFB Environmental Division. The area along the western coast of Vandenberg AFB is within the North Coast Planning Area. The base's coastal zone extends inland from about 1.2 kilometers (0.75 mile) at the northern boundary to 7.2 kilometers (4.5 miles) at the

southern end. The widest portion of the coastal zone occurs at San Antonio Creek and south of Cañada Honda Creek to the southern boundary (figure 1-1). (U.S. Department of the Air Force, 1998)

Recreation

County and state parks, as well as public access beaches on Vandenberg AFB proper, are some of the few public coastal access points between Gaviota and Point Sal. Two public access beaches that exist on, or immediately adjacent to, Vandenberg AFB (Point Sal Beach State Park and Ocean Beach County Park) are within the ROI. Both are especially popular for surf fishing and are open to the public, except during missile launches when access roads can be closed and visitors evacuated under an agreement between the base and Santa Barbara County. All closure and evacuation agreements have been consolidated under an Evacuation Agreement, giving the base the right to evacuate and close the beaches up to 48 hours before a launch. (U.S. Department of the Air Force, 1997)

In addition to the state beach and county parks, several coastal areas on Vandenberg AFB itself are open to public use. (U.S. Department of the Air Force, 1997)

3.9 NOISE

Noise is usually described as unwanted sound. Characteristics of sound include amplitude, frequency, and duration. Sound can vary over an extremely large range of amplitudes. The decibel (dB) is the accepted standard unit for the measure of the amplitude of sound because it accounts for the large variations in amplitude and reflects the way people perceive changes in sound amplitude. Sound pressure levels are easily measured, but the variability is subjective, and physical response to sound complicates the analysis of its impact on people. People judge the relative magnitude of sound sensation by subjective terms such as "loudness" or "noisiness."

Sound also varies with frequency or pitch. When describing sound and its effect on a human population, A-weighted sound levels, measured in A-weighted decibels (dBA), are typically used to account for the response of the human ear. The term "A-weighted" refers to a filtering of the sound signal to emphasize frequencies in the middle of the audible spectrum and to de-emphasize low and high frequencies in a manner corresponding to the way the human ear perceives sound. The American National Standards Institute established this filtering network. The A-weighted noise level has been found to correlate well with people's judgments of noisiness of different sounds and has been used for many years as a measure of community noise.

Noise is usually defined as sound that is undesirable because it interferes with speech communication and hearing, is intense enough to damage hearing, or is otherwise annoying. Noise levels often change with time; therefore, to compare levels over different time periods, several descriptors have been developed that take into account this time-varying nature. These descriptors are used to assess and correlate the various effects of

noise on humans and animals, including land-use compatibility, sleep interference, annoyance, hearing loss, speech interference, and startle effects.

The primary environmental noise descriptor used in environmental noise assessments is the A-weighted Day-Night Equivalent Sound Level (which is abbreviated DNL and symbolized as L_{dn}). The DNL was developed to evaluate the total daily community noise environment. The DNL is the average A-weighted acoustical energy during a 24-hour period, with 10 dBA added to all signals recorded within the hours of 10:00 p.m. and 7:00 a.m. The 10 dBA are a penalty accounting for the extra sensitivity people have to noise during typical sleeping hours.

Almost all federal agencies having non-occupational noise regulations use DNL as their principal noise descriptor for community assessments.

Region of Influence

Under federal OSHA regulations in 29 CFR 1910.95, employers are required to monitor employees who have exposure to an 8-hour time-weighted average of 85 dBA. Therefore, the ROI for noise analysis at Vandenberg AFB is defined as the area within the Maximum Sound Level (L_{max}) 85-dB contours generated by proposed project activities.

Affected Environment

The immediate area surrounding Vandenberg AFB is largely composed of undeveloped and rural land, with some unincorporated residential areas in the Lompoc and Santa Maria valleys and Northern Santa Barbara County. The cities of Lompoc and Santa Maria, which make up the two urban areas in the region, support a small number of localized industrial areas. Sound levels measured for the area are typically low, except for higher levels in the industrial areas and along transportation corridors. The rural areas of the Lompoc and Santa Maria valleys typically have a low overall noise level, 40 to 45 dBA. Infrequent aircraft flyovers and rocket launches from Vandenberg AFB increase noise level for a short period of time (U.S. Department of the Air Force, 1997).

Noise at Vandenberg AFB is typically produced by automobile and truck traffic, aircraft landings and takeoffs, and space vehicle launches. Railroad traffic is also a significant base noise. Existing noise levels on Vandenberg AFB are typically low; the higher levels occur near industrial facilities and transportation routes. Vandenberg AFB follows state regulations concerning noise, and maintains a Community Noise Equivalent Level (CNEL) equivalent to 65 dBA for off base areas.

Rocket launches from Vandenberg AFB produce less frequent but more intense sources of noise in the region. Current launches include Minuteman missiles and Delta II rockets launched from the North Base and Titan and Atlas rockets from the South Base. Maximum noise levels for the ABV flight tests during a launch have not been measured, but would be less than the noise from the larger Minuteman missile. Typical noise levels for familiar sources and Vandenberg AFB launch vehicles, such as the Minuteman, are summarized in table 3-3 and discussed below.

Table 3-3: Noise Levels of Common Sources

Source	Noise Level (dBA)	Comment
Sonic Boom	140	
Minuteman launch	Approx. 125	At 3 kilometers (1.8 miles)
Air raid siren	120	At 15.2 meters (50 feet) (threshold of pain)
Rock concert	110	
Minuteman launch	109	At 4.2 kilometers (2.6 miles)
Airplane, 747	102.5	At 304.3 meters (1,000 feet)
Jackhammer	96	At 3.0 meters (10 feet)
Power lawn mower	96	At 0.9 meters (3 feet)
Football game	88	Crowd size: 65,000
Freight train at full speed	88–85	At 9.1 meters (30 feet)
Portable hair dryer	86–77	At 0.3 meters (1 foot)
Vacuum cleaner	85–78	At 1.5 meters (5 feet)
Minuteman launch	80	At 12.7 kilometers (7.9 miles)
Long range airplane	80–70	Inside
Vacuum cleaner	70	At 3 meters (10 feet)
Typical aircraft traffic	70	Maximum any location in flight path
Conversation	60	
Typical suburban background	50	
Bird calls	44	
Quiet urban nighttime	42	
Quiet suburban nighttime	36	
Library	34	
Bedroom at night	30	
Audiometric (hearing testing) booth	10	Normal threshold of hearing

Source: Cowan, 1994; Vandenberg Air Force Base, 1999.

General Principles of Launch Noise Production

Three distinct noise events are associated with the launch and ascent of a launch vehicle: on-pad noise, inflight noise, and sonic boom. It is common to depict noise over an area by means of noise contours.

Sound production during rocket or missile launch is highly dependent on the type of first-stage booster and the fuel used to propel the vehicle. The vehicles can be classed according to size based on these aspects, with a great similarity in launch noise production within the size class. The ABV is smaller than missiles such as the Minuteman, analyzed in previous EAs.

On-Pad Noise

On-pad noise occurs when engines are firing while the vehicle is on the launch pad. The vehicle exhaust is usually turned horizontally by deflectors or an exhaust tunnel. Noise is highly directional, with maximum levels in lobes that are about 45 degrees from the main direction of the deflected exhaust. Noise levels at the vehicle and within the launch complex are high. Because the sound source is at or near ground level, propagation from vehicle to offsite locations grazes along the ground and tends to attenuate significantly over distance. On-pad noises are typically much lower than in-flight noise levels because sound propagates in close proximity to the ground and undergoes significant attenuation when the vehicle is on or near the pad.

In-Flight Noise

In-flight noise occurs when the vehicle is in the air, clear of the launch pad, and the engine exhaust plume is in line with the vehicle. In the early part of the flight, when the vehicle's motion is primarily vertical, noise contours are circular. The sound is also well above the ground and therefore undergoes less attenuation as it propagates to long distances. The shapes of the contours for the launch vehicle ascent are approximately circular, particularly for the higher levels near the center. Because the contours are approximately circular, it is often adequate to summarize the noise by providing the sound levels at various distances from the launch site.

On-pad noise contours are spaced closer together than in-flight contours. Because in-flight noise is much greater than on-pad noise, analysis of the Proposed Action will focus on in-flight noise. The major source of in-flight noise is from mixing the exhaust flow with the atmosphere, combustion noise in the combustion chamber, shock waves and turbulence in the exhaust flow, and occasional combustion noise from the post-burning of fuel-rich combustion products in the atmosphere. The emitted acoustic power from a rocket engine and the frequency spectrum of the noise can be calculated from the number of engines, their size and thrust, and their flow characteristics.

Sonic Boom

Another noise characteristic of launch vehicles is that they reach supersonic speeds and will generate sonic booms. Sonic booms can vary from inconsequential to severe, depending on the physical aspects of the launch vehicle, the trajectory of the launch, and the weather conditions at the time of launch. Typically, vehicles launched in a southerly direction from Vandenberg AFB can have booms that impact on the Northern Channel Islands. Vehicles launched from north Vandenberg AFB do not have southern trajectories and the booms generated by these launches only impact the open ocean. Physical features of the launch vehicle that influence the occurrence and intensity of sonic booms include the vehicle's overall length and width, the length of each stage and the shape of the nose cone.

3.10 WATER RESOURCES

This section describes the existing water resource conditions at the proposed sites. Water resources include surface water, groundwater, water quality, and flood hazard areas.

Region of Influence

The ROI for impacts to water resources includes the water bodies that could be potentially disturbed by the Proposed Action.

Affected Environment

Surface Water

Vandenberg AFB crosses the northern San Antonio Creek and the southern Santa Ynez River watersheds. Its location in a region of low precipitation creates only the seasonal flow of surface streams and existence of small ponds.

The Santa Ynez River forms the boundary between northern and southern Vandenberg AFB. Several drainages occur in the southern part of the base, with Cañada Honda Creek and Bear Creek being the largest (see figure 1-1). There are no permanent lakes, impoundments, or perennial streams on southern Vandenberg AFB.

Northern Vandenberg AFB has three primary drainage systems that terminate in the ocean: Canada Tortuga Creek, San Antonio Creek, and Shuman Canyon Creek (see figure 1-1). San Antonio Creek is the largest with perennial flow and a yearly runoff of 4.4 million cubic meters (3,600 acre-feet). Five small impoundments are also located on northern Vandenberg AFB. (U.S. Army Space and Strategic Defense Command, 1994)

Groundwater

Most groundwater on Vandenberg AFB occurs in unconsolidated alluvial deposits beneath river and stream channels in the valleys and canyons (U.S. Department of the Air Force, 2000). The southern portion of the base includes a part of the Lompoc Terrace Basin and the Lompoc Plain Basin. Other users of the Lompoc Plain Basin include the Federal Correctional Institute and the City of Lompoc. The San Antonio Creek Basin is on northern Vandenberg AFB; agricultural irrigation is the main user of the basin's groundwater. (U.S. Army Space and Strategic Defense Command, 1994)

Water Quality

Exposure of Vandenberg AFB's surface water to on-base activities and local agricultural runoff limits potable water to groundwater sources supplied by the San Antonio Aquifer and the Lompoc Terrace Groundwater Basin. Wells used to supplement the purchased potable water supply are monitored by the base for a series of water quality parameters. All of the base's drinking water meets both federal and state drinking standards. (Vandenberg Air Force Base, 2002)

Flood Hazard Areas

LF-23 is not located within a flood hazard area.

4.0

ENVIRONMENTAL CONSEQUENCES

4.0 ENVIRONMENTAL CONSEQUENCES

This section describes the potential environmental consequences of the proposed activities by comparing these activities with the potentially affected environmental components. Section 4.1 provides discussions of the potential environmental consequences of these activities. The amount of detail presented in each section is proportional to the potential for impacts. Sections 4.2 through 4.10 provide discussions of the following with regard to proposed program activities: environmental effects of the No-action Alternative; adverse environmental effects that cannot be avoided; conflicts with federal, state, and local land use plans, policies, and controls for the area concerned; energy requirements and conservation potential; irreversible or irretrievable commitment of resources; relationship between short-term use of the human environment and the maintenance and enhancement of long-term productivity; natural or depletable resource requirements and conservation potential; Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*; and Executive Order 13045, *Federal Actions to Address Protection of Children from Environmental Health Risks and Safety Risks*.

To assess the potential for and significance of environmental impacts from the proposed program activities, a list of activities was developed (chapter 2.0) and the environmental setting was described, with emphasis on any special environmental sensitivities (chapter 3.0). Program activities were then assessed with the potentially affected environmental components to determine the environmental impacts of the proposed activities.

To help define the affected environment and determine the significance of program-related effects, written, personal, and telephone contacts were made with applicable agencies and installations. Chapter 7.0 provides a list of those contacted, and appendix B provides copies of correspondence from the agencies.

No new impacts to airspace are anticipated as a result of the proposed activities. Personnel would be drawn from the existing workforce, with minimal beneficial impacts to socioeconomics in the affected regions.

4.1 PROPOSED ACTION

4.1.1 AIR QUALITY

Santa Barbara County is in attainment for all air quality standards except the federal and state ozone standards, and the state standard for PM-10. The Proposed Action would not substantially impact the regional air quality unless the estimate of total operation emissions of the project exceeds current air quality standards within the Santa Barbara Air Basin.

Pre-Launch Activities

Facility modifications and site preparation activities necessary for the ABV tests would have a localized, minimal impact on air quality. Emissions from pre-launch activities would be regulated in accordance with the Memorandum of Agreement between Vandenberg AFB and the SBCAPCD. Vandenberg AFB complies with the SBCAPCD rules and regulations listed below. The Proposed Action would comply with these and any other applicable rules.

- Rule 317, *Organic Solvents*, provides limits to any solvent materials used in the project.
- Rule 323, *Architectural Coatings*, provides for coating materials applied to an architectural structure.
- Rule 330, *Surface Coating of Metal Parts and Products*, applies if metal parts are coated on base prior to construction.
- Rule 353, *Adhesives and Sealants*, applies if adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, or any other primers are used during the project unless specifically exempted by this rule.
- Only California Air Resources Board-certified blasting medium would be permitted if abrasive blasting were used.
- Any portable equipment powered by an internal combustion engine of 20 British horsepower or higher used in this project must be registered in the California State-wide Portable Equipment Registration Program or have a valid SBCAPCD Permit to Operate. (Vandenberg Air Force Base, 2001b)

No exceedance of air quality standards or health-based standards of non-criteria pollutants would be anticipated during site preparation activities.

Launch Activities

Launch activities would also comply with the rules listed above. Emissions from rocket and missile launches are not considered stationary sources by the SBCAPCD. For example, all the support equipment for the planned activities at Vandenberg AFB was permitted, except for the emissions from the rockets (U.S. Department of the Air Force, 1997).

No exceedance of air quality standards or health-based standards of non-criteria pollutants is anticipated. Missile launches are short-term, discrete events, thus allowing time between launches for emission products to be dispersed. As indicated in the 1999 Booster Verification Tests EA and the 1997 Targets Programmatic EA, air quality impacts from prior Vandenberg AFB target launches have been determined to be insignificant. Based on these results, the six proposed launches would not cause or contribute to violation of any air quality standards.

Determination of Non-Applicability

Air quality impacts from Vandenberg AFB missile launches similar in size and type of propellant to the ABV have been previously examined in the Theater Ballistic Missile

Targets EA. It was determined that approximately 2.7 metric tons (3 tons) of volatile organic compounds (reactive organic gases) and 1.8 metric tons (2 tons) of nitrogen oxide would be emitted as a result of 30 missile launches (solid and liquid) per year, including mobile and launch emissions (U.S. Department of the Air Force, 1997). The federal *de minimis* annual limits are 45 metric tons (50 tons). The SBCAPCD emission budgets for on-road mobile source reactive organic gases and nitrogen oxides are 15.8 metric tons (17.42 tons) and 20 metric tons (22.07 tons) per day, respectively. Analysis provided in the Theater Ballistic Missile Targets EA determined that five target missile launches in one day would result in 0.070 metric ton (0.078 ton) of reactive organic gases and 0.102 metric ton (0.112 ton) of nitrogen oxides.

No federal *de minimis* levels have been established for state non-attainment areas. However, potential emissions are less than the federal *de minimis* level for serious federal PM-10 non-attainment. Additionally, since the region is in federal attainment, SBCAPCD has not established 2001 planning values for PM-10. Therefore, no quantitative analysis of regional significance can be made.

Based on these results, the review of the Proposed Action as required by the General Conformity Rule resulted in a finding of presumed conformity with the State Implementation Plan. Total foreseeable direct and indirect emissions caused by the launch of six ABV over a 5-year period are both less than the mandated federal *de minimis* thresholds and less than 10 percent of the established SBCAPCD budget. The two proposed launches would not cause or contribute to any new violation of any air quality standards in the ROI and should be ruled as being exempt from the requirement for a Conformity Determination due to non-applicability.

Post-Launch Activities

Post-launch activities would include removal of the blast residue generated by the ABV tests (propellant byproducts, paint burned off the silo, and umbilical cable) that would be contained within the silo. Any such blast residue would be properly scraped/swept up, collected, and then placed in containers appropriately labeled as hazardous or nonhazardous waste for disposal. If the residue were determined to be hazardous, then it would be disposed of as hazardous waste, according to federal and state regulations and the Vandenberg AFB *Hazard Waste Management Plan* and would not result in impacts to Vandenberg AFB or regional air quality.

Cumulative Impacts

No exceedance of air quality standards or health-based standards of non-criteria pollutants is anticipated. Missile launches are short-term, discrete events, thus allowing time between launches for emission products to be dispersed. Approximately 20 missile launches are estimated for fiscal year 2002 based on ballistic test requirements. The emissions from the Proposed Action when added to existing and proposed actions on Vandenberg AFB and within the South Central Coast Air Basin would not result in a cumulative impact to the region's air quality. Air quality impacts from prior Vandenberg AFB missile launches, such as those examined in the 1999 Booster Verification Tests EA and the 1997 Targets Programmatic EA, have been determined to be insignificant. Based

on these results, the six proposed launches over a 5-year period are not anticipated to cause or contribute to any violation of any air quality standards.

4.1.2 BIOLOGICAL RESOURCES

The primary proposed activities that may have a potential effect on the vegetation and wildlife of Vandenberg AFB include pre-launch activities such as launch site preparation, launch activities, and post-launch activities. Impacts that could result from launch site preparation include vegetation disturbance and removal, and disturbance to wildlife from the accompanying noise and presence of personnel. Impacts could also result from launch-related activities such as noise, air emissions, and debris impacts.

All transportation of equipment and materials such as fuels would be conducted in accordance with DOT regulations and U.S. Air Force regulations such as Air Force Policy Directive 24-2, *Preparation and Movement of Air Force Materiel*, and AFI 24-201, *Cargo Movement*. Adherence to SOPs for spill prevention, containment, and control measures while transporting equipment and materials would preclude impacts to biological resources.

Pre-Launch Activities

Vegetation

Minor modification/construction would be required as part of proposed ABV activities, and thus there would be little to no ground disturbance and resultant impact to vegetation in or around LF-23, as well as Buildings 1819, 1959, and 1978. There would be no modification or site preparation required for Building 1555, and therefore no vegetation impacts are anticipated.

The installation of an underground fiber-optic cable (for communications purposes) would be required between Building 1959 and LF-23. The fiber-optic cable would be installed in existing conduit from Building 1959 along Globe Road, then up Soldado Road until its intersection with Sercho Road. From this intersection, new conduit and fiber-optic cable would be installed for the small distance between that location and the launch facility. This is anticipated to require minor excavation on existing road shoulders, which should pose no impact to adjacent vegetation.

A temporary aboveground fiber-optic cable may be used as an interim solution to the underground cable. This cable is not expected to have any adverse impacts on vegetation.

Threatened and Endangered Vegetation. No adverse impacts are anticipated to the Gaviota tarplant and Lompoc yerba santa as a result of pre-launch activities since these plants have not been identified at LF-23.

Wildlife

Pre-launch activities, which would include trenching for fiber optic cable, would implement procedures to minimize the potential for soil erosion and are not expected to adversely affect waterbodies, including Essential Fish Habitat.

Pre-launch activities would be limited in duration, and no direct physical auditory changes are anticipated. Typically the noise at 15 meters (50 feet) from a construction site does not exceed an equivalent sound level of 90 dBA. Most of the site preparation noise and human activity would be caused by truck traffic to and from the launch site and the potential short-term use of heavy machinery. Site preparation may disturb wildlife in the immediate area. The effects of noise on wildlife vary from serious to no effect in different species and situations. Behavioral responses to noise also vary from startling to retreat from favorable habitat, due partly to the fact that wildlife can be very sensitive to sounds in some situations and very insensitive to the same sounds in other situations (Larkin, 1996). Since there are no absolute standards of short-term noise impacts for potentially noise-sensitive species, a short-term maximum noise exposure of 92 dB has been suggested as a significance cut-off for impacts (U.S. Army Strategic Defense Command, 1989; 1990). This noise level is equivalent to being 1 meter (3 feet) from a power lawnmower.

Disturbance would be restricted mainly to areas within 15 meters (50 feet) from the construction site. The increased presence of personnel would tend to cause birds and other mobile species of wildlife to temporarily evacuate areas subject to the highest level of noise. Additional ruderal vegetation is nearby for displaced wildlife.

California sea lions, northern elephant seals, northern fur seals, and other sensitive marine mammals in adjacent offshore areas would normally be at least 1,250 meters (4,100 feet) from the launch site and are not expected to be affected by site preparation noise.

Threatened and Endangered Wildlife. Pre-launch activities would not occur in areas that could result in impacts to water bodies that could potentially contain the tidewater goby, unarmored threespine stickleback, or California red-legged frog.

The California least tern, California brown pelican, and western snowy plover preferentially forage and roost along the coast approximately 1,250 meters (4,100 feet) away from the proposed launch area and are unlikely to be affected by site preparation noise.

Pre-launch activities are also not anticipated to result in impacts to the southern sea otter or other sensitive marine mammals in adjacent offshore areas due to the distance from the launch site to the shoreline (approximately 1,250 meters [4,100 feet]).

Environmentally Sensitive Habitat

The coastal dune systems are outside the area that could potentially be disturbed during pre-launch activities at LF-23. Pre-launch activities are not anticipated to directly or

indirectly impact the wetlands approximately 1.6 kilometers (1 mile) northwest of Building 1819.

Launch Activities

Vegetation

Blast residue would be contained within the silo, minimizing the potential for impacts on vegetation. All applicable U.S. Air Force, DOT, and U.S. Army safety regulations, and OSHA requirements would be followed. Compliance with these regulations would minimize the potential for accidental spills, as well as provide the means for mitigating or minimizing effects to vegetation if an accident were to occur.

Nominal launch activities during dry conditions could result in the deposition of very small amounts of aluminum oxide from missile exhaust. Most of the aluminum oxide would be suspended in air and dispersed over extremely large areas; the amount deposited in surface waters would have little effect. Under natural conditions, the chemical is not a source of toxic aluminum; the EPA has determined that nonfibrous aluminum oxide, as found in solid rocket motor exhaust, is nontoxic (U.S. Department of the Air Force, 1997).

Rain within 2 hours of launch could cause hydrogen chloride to be deposited in small quantities. This chemical, when emitted during solid propellant missile launches for very large flight vehicles (such as the space shuttle), is known to injure plant leaves and affect wildlife. However, the potential impact on vegetation and wildlife from the proposed launch of the smaller ABV is expected to be slight. As regards surface waters, the hydrogen chloride would cause a change in pH of only short duration; any alteration of the water's pH would be almost imperceptible. (U.S. Department of the Air Force, 1997)

Vandenberg AFB has a wildland fuels management plan, prepared by the U.S. Forest Service, containing measures to help prevent large wildfires (such as prescribed burning activities which lower the age class of area vegetation). Moreover, emergency fire-fighting personnel are on stand-by status for all launch activities as a protective measure.

Threatened and Endangered Vegetation. No adverse impacts are anticipated to the Gaviota tarplant and Lompoc yerba santa as a result of nominal launch activities since these plants have not been identified at LF-23.

Wildlife

Emissions. The small quantities of hydrogen chloride that could potentially be deposited are not expected to injure or affect wildlife. The hydrogen chloride would cause a change in pH of only short duration and any alteration of the water's pH would be almost imperceptible. The Environmental Protection Agency has determined that non-fibrous aluminum oxide from solid rocket exhaust is non toxic (Vandenberg Air Force Base, 1999).

Threatened and Endangered Wildlife. As mentioned above, hydrogen chloride and aluminum oxide deposition is not anticipated to adversely affect wildlife, including threatened or endangered wildlife species.

Noise. The primary potential for impacts to wildlife would be from the noise created during the proposed missile launches. Noise from Minuteman launches ranges from 98 dBA approximately 4.2 kilometers (2.6 miles) from the launch site to 80 dBA approximately 13 kilometers (8 miles) from the launch site. The level of noise for the ABV missile during launch and flight is expected to be less and relatively short in duration. At approximately the same distance from the LF, the previous booster vehicle-2 launch (GBI vehicle) was 6 dB less than the Minuteman III launch and 17 dB less than Peacekeeper launches.

Pacific harbor seals, the main pinniped species using north Vandenberg AFB, would normally be at least 2.0 kilometers (1.2 miles) from the launch site. Other pinnipeds such as California sea lions and northern elephant seals may haul-out temporarily on beaches several kilometers (miles) from the launch facility. Noise from prior launches has not appeared to affect pinniped use of the coastal areas on Vandenberg AFB. Pinniped monitoring has been performed for launches of larger missiles on north Vandenberg AFB such as the Peacekeeper and Delta II. The effect to harbor seals, which were most susceptible to disturbance, has been a negligible short-term (5- to 30-minute) abandonment of a haul-out area at Spur Road and Purisima Point. No pinniped mother-pup separations have been noted at the harbor seal haul-out sites closest to the launch site. Recent surveys discovered a new harbor seal haul-out site on north Vandenberg AFB that is regularly used by up to three harbor seal mothers and their pups. The U.S. Air Force, 30 SW, Vandenberg AFB began monitoring harbor seals at this site for Minuteman and Peacekeeper launches (launch reports in preparation) that occurred during the harbor seal pupping season (March through June) in accordance with the 5-year programmatic permit and letter of authorization issued by National Marine Fisheries Service to the 30 SW.

Noise monitoring would be performed during the initial launch of an ABV and harbor seal monitoring would be conducted during the pupping season in accordance with Vandenberg AFB guidelines. The U.S. Air Force, 30 SW, Vandenberg AFB has requested that ABV launches be included along with previously approved Peacekeeper and Minuteman launches in the 10 (total) intercontinental ballistic missile launches allowed under their 5-year programmatic permit and letter of authorization. No expansion of the 10 launch (total) limit is desired or requested.

The disturbance to pinnipeds as a result of visual stimulus is unlikely due to the approximate altitude of 1,250 meters (4,100 feet) an ABV could reach as it approaches the coastline. The intermittent launches planned for the ABV test flights (six flights over a 5-year period) are not expected to substantially impact marine species. (U.S. Department of the Air Force, 1999)

Wildlife in general is known to exhibit a startle response when exposed to short-term noise impacts. Studies (U.S. Department of the Air Force, 1997) indicate that birds usually show signs of disturbance, such as the fluttering of wings, when the noise occurs, but quickly return to normal behavior after the event. Disturbance to wildlife from the launches would be brief and is not expected to have a lasting impact nor a measurable negative effect on migratory bird populations. Waterfowl would quickly resume feeding and other normal behavior patterns after a launch is completed. Waterfowl driven from

preferred feeding areas by aircraft or explosions usually return soon after the disturbance stops, as long as the disturbance is not severe or repeated (Federal Aviation Administration, 1996).

Threatened and Endangered Wildlife. The California least tern, California brown pelican, and western snowy plover preferentially forage and roost along the coast approximately 1,250 meters (4,100 feet) away from the proposed launch area. Noise levels 4.2 kilometers (2.6 miles) from the launch site during previous Minuteman missile launches were 98 dBA. No effects to sensitive bird species have been identified. The ABV is a smaller vehicle with less propellant than a Minuteman and lower noise levels are anticipated. Proposed launch activities are unlikely to adversely affect the long-term well-being, reproduction rates, or survival of these listed birds. The level of noise for the ABV during launch and flight is also expected to be relatively short in duration. Noise monitoring would be performed for the first launch. The 30 SW has determined that Endangered Species Act Section 7 consultation is not required.

Southern sea otters in adjacent offshore areas would also be at least 1,250 meters (4,100 feet) from the launch site. Noise from prior launches has not appeared to affect sea otter use of the coastal areas on Vandenberg AFB. Noise from launches of the larger Delta II missile has not affected use of coastal areas by sea otters with dependent pups. Disturbance as a result of visual stimulus is unlikely because the ABV would be at an altitude of 1,250 meters (4,100 feet) as it approaches the coastline. The intermittent launches planned for the ABV test flights (six flights over a 5-year period) are not expected to substantially impact the southern sea otter. (U.S. Department of the Air Force, 1997; 1999)

Debris. Nominal launch activities are not expected to adversely impact Essential Fish Habitat. Although spent boosters and intercept debris could affect any species close to the surface, the number of individuals injured or killed would not likely affect overall species' populations. The majority of propellant would be expended before booster drop and impact and thus only trace amounts of propellant would be left, which would minimize the potential for toxic effects. (U.S. Department of the Air Force, 2001)

In the unlikely event of a launch mishap, scattered pieces of burning propellant could enter coastal water and potentially affect pinnipeds hauled out along the adjacent coastline and Essential Fish Habitat. Concentrations of toxic materials would be highest in this shallow water and have a greater chance of being ingested by feeding animals. However, the potential for a launch mishap is relatively slight and in most cases the errant missile would be moving at a rapid rate such that pieces of propellant and other toxic debris would strike the water further downrange. The debris would also be widely scattered, which would reduce the possibility of ingestion. As mentioned above, the number of individuals injured or killed would not likely affect overall species' populations. (U.S. Department of the Air Force, 2001)

Debris impact and booster drops in the broad ocean area off the coast are not expected to adversely affect marine mammal species protected by the Marine Mammal Protection Act

of 1972. An early flight termination or mishap could result in debris impact along the flight corridor. Early flight termination could result in widely scattered debris, but the probability of this debris hitting wildlife is remote.

Fire from an early flight termination could impact terrestrial wildlife near the launch site. However, emergency fire-fighting personnel are on stand-by status for all launch activities as a protective measure.

In the unlikely event of an accidental release of stored liquid propellant, Vandenberg AFB's *Risk Management Plan* would be implemented in order to prevent impacts to biological resources in the vicinity. All applicable U.S. Air Force, DOT, and U.S. Army safety regulations, and OSHA requirements would be followed which would minimize the potential for accidental spills, as well as provide the means for mitigating or minimizing effects to wildlife if an accident were to occur. With the *Risk Management Plan* in place, no impacts to wildlife are expected as a result of accidental release of liquid propellant.

Threatened and Endangered Wildlife. Debris from nominal launches is not expected to impact water bodies that could potentially contain the tidewater goby, unarmored threespine stickleback, or California red-legged frog.

As discussed above, sensitive marine species in the ocean are widely scattered and occupy relatively small surface areas, and the probability of debris striking a threatened or endangered species is considered remote.

Environmentally Sensitive Habitat

No adverse impacts to the coastal dune systems are anticipated as a result of launch activities. Personnel would be instructed to avoid bird nesting and roosting locations and pinniped haulout areas. Nominal launch activities are not anticipated to impact the wetlands approximately 1.6 kilometers (1 mile) northwest of Building 1819. An early flight termination or mishap would result in widely scattered debris, which could potentially impact the wetlands. Debris would be recovered and removed if practicable.

Post-Launch Activities

Post-launch activities would include removal of the blast residue (propellant byproducts, burnt paint, and umbilical remnants) from the silo and minor facility maintenance, which would not result in impacts to vegetation, wildlife, including threatened and endangered species, or environmentally sensitive habitat.

Cumulative Impacts

The potential cumulative impacts to biological resources from activities associated with site preparation and the ABV launches would not be substantial.

No cumulative impacts to biological resources are expected as a result of fuel and oxidizer transport or filling operations. Accidental releases or spills of liquid or gaseous materials

would be contained or dispersed before reaching sensitive vegetation or wildlife. The amount of gaseous materials dispersed during launch is not expected to result in an increased potential for cumulative impact to marine species when combined with the approximately 20 missile launches estimated for fiscal year 2002.

4.1.3 CULTURAL RESOURCES

This section discusses the effects of the Proposed Action on Vandenberg AFB cultural resources. The disturbance of an archaeological site removes cultural material from its original context and, therefore, results in the loss of information about the site.

Pre-Launch Activities

A Vandenberg AFB archaeologist accompanied the cable siting team and determined that no impacts to cultural resources are anticipated from use of the area selected for fiber optic cable installation. The trenching for cable installation would not go below the sub-base of the selected access roads. No historic or register-eligible properties would be affected by proposed modification activities. Since all construction would take place on existing concrete pads or within previously graded or graveled areas, the proposed construction activities would have no effect on cultural resources including historic properties. The 30 SW has determined that National Historic Preservation Act Section 106 consultation is not required.

The GMD Joint Project Office would be responsible for implementation of any required avoidance of cultural resources or mitigation measures assigned to this project as a condition of approval for this activity. Any required State Historic Preservation Officer consultation would be done in coordination with Vandenberg AFB. If previously undocumented cultural resource items are discovered during excavation, grading, or other ground-disturbing activities, work would immediately cease. In addition, work would be temporarily suspended within 30 meters (100 feet) of the discovered item until it has been properly evaluated and secured. Any discovery of previously unidentified cultural resources would be reported to the Vandenberg Base Historic Preservation Officer.

Launch Activities

Only in the unlikely event of flight termination over land (necessitating debris recovery within the ROI) would the possibility exist for impacts to cultural resources from off-road vehicle activity. Even then, all areas affected by ground impacts of flight hardware would be cleared of all recoverable debris in strict accordance with current Vandenberg AFB policy.

Other potential effects could result from this debris striking the ground where surface or subsurface archaeological deposits are located. The possibility of this occurring, however, is considered extremely remote due to the low probability of a launch mishap combined with the fact that the sites are scattered. Debris falling offshore would pose no threat to Vandenberg AFB's cultural resources.

Potentially adverse effects to area historic and prehistoric resources could also occur as a result of the unauthorized collection of artifacts by flight preparation personnel. Personnel would receive a brief orientation involving a definition of cultural resources and protective federal regulations.

Post-Launch Activities

Post-launch activities would consist of silo inspection, removal of blast residue, and minor silo refurbishing. No impacts to cultural resources are anticipated during this phase of the Proposed Action.

Cumulative Impacts

Launching up to six ABV test flights over a 5-year period when combined with current missions (approximately 20 missile launches estimated for fiscal year 2002) on Vandenberg AFB is not anticipated to result in cumulative impacts to cultural resources.

4.1.4 GEOLOGY AND SOILS

This section addresses the potential impacts to geology and soils due to the site modifications and launch activities required for the Proposed Action.

Pre-Launch Activities

Site preparations would require launch support equipment installation, overhead power installation, silo modifications, and minor excavation of existing access road surfaces to install an underground fiber-optic cable to already existing facilities at Vandenberg AFB. Launch support equipment installation may result in minor, short-term impacts to adjacent soils. The staging areas for any construction materials and equipment associated with the modification of the missile launch silo or Buildings 1959 and 1978 would be paved. A shallow trench would be excavated on the access roads to LF-23. The trench should not go below the road sub-base, and the road surface would be repaved. Only minor impacts to geology and soils are anticipated.

Although the facilities and roads are located in earthquake-related areas, no evidence from previous construction or continual presence of these facilities appears to promote any hazards to the local geology or soil resources.

A Stormwater Pollution Prevention Plan would be developed for the site by the ABV program in coordination with 30 SW to satisfy the requirements of the National Pollutant Discharge Elimination System. The Vandenberg AFB Spill Prevention Control and Countermeasure Plan (30 SW Plan 32-4002C) would provide resources and guidelines for use in the control, cleanup, and emergency response for spills of hazardous material or waste. In the event that the release of hazardous material or waste would occur, affected areas would be treated in accordance with applicable federal, state, and local regulations. Therefore, the risk of accidental spills of hazardous chemicals during project site preparation affecting project soils is expected to be minor and temporary in duration.

Launch Activities

Nominal launch activities could result in the deposition of very small amounts of aluminum oxide from missile exhaust products. Rain within 2 hours of a launch could result in the deposition of small amounts of hydrogen chloride. The amount of aluminum oxide deposited on the ground would not seriously change the soil chemistry. The hydrogen chloride would be buffered by the soil and would not dramatically alter the soil pH.

Post-Launch Activities

Post-launch activities would include general maintenance and removal of the blast residue from the silo. No impacts to geology and soils are anticipated.

Cumulative Impacts

Preparation of the launch site and other areas for the proposed activities would not result in cumulative impacts to geology and soils. The addition of up to six launches over a 5-year period, when added to the missile launches per year typical at Vandenberg AFB, would not result in a substantial impact to soils. Approximately 20 missile launches are estimated for fiscal year 2002 based on ballistic test requirements. Adherence to established procedures would minimize the potential for spills and any impacts to soils. The potential for cumulative impacts on soil is considered minor.

4.1.5 HAZARDOUS MATERIAL AND WASTE

Impact to hazardous material and waste management includes increasing the potential for exposure to hazardous material or waste, or increasing the likelihood of a hazardous material or waste release to the environment. Impacts to hazardous materials and waste management would also be considered if they resulted in noncompliance with applicable regulatory guidelines, including 40 and 42 CFR and California Code of Regulations Title 27, or increased the amounts generated beyond available waste management practices. The proposed launches of ABVs from LF-23 are not expected to substantially increase the volume of hazardous materials used, or hazardous waste generated, at Vandenberg AFB. MDA would be responsible for the shipment and distribution of hazardous materials to the base. Vandenberg AFB Safety and Environmental offices would be responsible for the receipt and storage of hazardous materials, and the disposal of hazardous waste.

Pre-Launch Activities

Modification of the existing launch silo (LF-23) would be required to accommodate the ABV. Buildings 1959 and 1978 would serve as communication support and the LCC, respectively, and would require minor internal modifications. Buildings 1555 and 1819 do not require modification. The staging areas for any construction materials and equipment associated with the modification of the missile launch silo or Buildings 1959 and 1978 would be paved. Since the proposed facilities were constructed in a period during which lead-based paint was used as exterior and interior coating and asbestos was used in equipment and construction materials, the minor modifications planned could result in disturbance of asbestos and/or lead-based paint on exterior or interior surfaces.

Prior to the initiation of any construction/structural modification, the ABV program contractor would perform surveys and sampling for lead-based paint, asbestos, and PCBs using applicable federal, state regulations, the Vandenberg AFB Lead-Based Paint Management Plan, AFI 32-1052, Facility Asbestos Management, the Vandenberg AFB Asbestos Management Plan, the Asbestos Operating Plan, the Vandenberg AFB PCBs Management Plan, and the Vandenberg AFB Hazardous Waste Management Plan. Any removal/abatement or disposal of these hazardous wastes would be conducted in accordance with applicable federal and state regulations, and the referenced AFI and Vandenberg AFB management plans and requirements. Therefore, there is a low likelihood of the potential release of lead-based paint, asbestos, or PCBs.

The potential installation of new conduit and fiber-optic cable between LF-23 and Building 1959 would require trenching on Sercho Road for placement of the conduit, which would not likely result in the release of a potentially hazardous material or waste.

Missile components would arrive at Vandenberg approximately 4 to 6 weeks prior to ABV launch and would be stored in Buildings 1819 and 1555. Missile components, such as the pre-fueled booster and bi-propellant tanks, would be handled and stored by ABV program personnel in accordance with applicable federal, state, and U.S. Air Force regulations. The three stage boosters would contain no more than 30,400 kilograms (67,000 pounds) of a hydroxyl-terminated polybutadiene, solid rocket fuel propellant. The GBI KV emulator may consist of hypergolic fuel and oxidizer propellant tanks. The GBI KV emulator may contain 9 to 14 kilograms (20 to 30 pounds) of monomethylhydrazine and nitrogen tetroxide liquid propellant. An ESQD would be established around Building 1819 and 1555 based on the equivalent explosive force of propellant contained within the ABV missile.

Hazardous materials that may be used during pre-launch activities include cleaners, solvents, lubricants, and motor and diesel fuel. These materials would be consumed during use, generating minimal waste. In the unlikely event that a spill or release occurs, the use of procedures outlined in the Vandenberg AFB Pollution Prevention Plan (30 SW Plan 32-7080), Spill Prevention Control and Countermeasure Plan 30 SW Plan 32-4002C), Hazardous Materials Emergency Response Plan (30 SW Plan 32-4002A), and Hazardous Materials Management Plan (30 SW Plan 32-7086) would ensure that the potential impact would be minimal.

Launch Activities

Missile components and hazardous materials to be used for ABV launch activities would be stored in Buildings 1819 and 1555 upon arrival at the base. Both of these structures are located in north Vandenberg AFB. An ESQD would be calculated around the launch site based on the equivalent explosive force of all propellant and pyrotechnic materials contained within the ABV missile. Prior to each launch, the Vandenberg AFB Safety Office computes a toxic hazard corridor to ensure surrounding communities are not at risk in the event of an anomaly. Only when meteorological conditions indicate this corridor does not extend off the base is the operation allowed to proceed.

It is possible for a missile booster to detonate or for the propellant to burn but not explode and terminate the launch at the launch site. It is also possible for missile flight to be terminated at the point of or shortly after liftoff, or to be terminated shortly after the missile has left the launch pad. In accordance with Range Safety Requirements, EWR 127-1, an emergency response team from Vandenberg AFB would be on stand-by near the launch site to ensure immediate response and rapid control in the event of such an occurrence. The emergency response team would consist of Vandenberg AFB fire fighting, safety, medical and bio-environmental engineering personnel.

If a launch is terminated after the missile has left the launch pad, then hazardous material would remain within the ESQD/evacuation zone and there would be minimal impact to personnel and no impact to the public from an accidental release. Any debris would fall within the Vandenberg AFB WTR and the open ocean west of the base. Areas such as oil rigs and shipping lanes would be verified clear of ships and persons prior to launch in accordance with existing Vandenberg AFB SOPs. Any debris falling on Vandenberg AFB would fall in areas cleared prior to launch and would be handled in accordance with Vandenberg AFB emergency response plans. Attempts are made to recover such debris where possible and recovery, sponsored by the test agency, includes both test article debris and explosive ordinance (as applicable).

Additional safety procedures are discussed in section 4.1.6.

Post-Launch Activities

Specific restoration actions, if necessary, would be determined on a case-by-case basis in coordination with the procedures of the Facility Services Division of Hazardous Materials.

Minor facility maintenance would occur after each ABV launch to ensure that the launch site would be operational for the next ABV test. Post-launch procedures would include silo inspection, removal of blast residue, and minor silo refurbishing. Approximately four to eight personnel would be involved in post-launch activities at the launch site.

Blast residue (propellant byproducts, burnt paint, and umbilical remnants) generated from the launch would remain within the launch silo. Entry to the silo would be restricted to trained and approved personnel in proper protective equipment. The residue would be manually removed from the silo walls, collected and containerized in 208-liter (55-gallon) drums, and properly disposed of according to 40 CFR, California Code of Regulations Title 22, and the Vandenberg AFB Hazardous Waste Management Plan. Should the residue be identified as hazardous, there would be no impact from the volume of waste generated. The Vandenberg AFB Collection Accumulation Point would be able to properly handle and ultimately dispose of the hazardous waste generated by the Proposed Action. Silo refurbishing may include minor touch-up painting on the top of the silo.

Cumulative Impacts

Adherence to the hazardous materials and waste management systems on Vandenberg AFB would preclude the potential accumulation of hazardous materials or waste. The

base has implemented an emergency response procedure that would aid in the evaluation and cleanup of any hazardous materials released. The Proposed Action is not expected to result in cumulative hazardous materials and hazardous waste impacts.

4.1.6 HEALTH AND SAFETY

An impact would be considered if it involved materials or operations that posed a potential public or occupational health hazard. The Proposed Action is not expected to substantially increase health and safety risk to either base workers and personnel or members of the public.

Pre-Launch Activities

Launch preparation activities, including silo and building modifications, would comply with OSHA, U.S. Air Force safety and health regulations, the U.S. Army Corps of Engineers Safety and Health Requirements Manual (EM 385-1-1), Range Safety Requirements and other recognized standards for operations that involve construction or facility modifications.

Restricted public access to the proposed project site would be ensured through use of signs and fencing. A health and safety plan would be prepared by the contractor and submitted to the base to ensure the health and safety of onsite workers. A formally trained individual would be appointed to act as safety officer. The appointed individual would be the point of contact on all problems involving job site safety. During performance of work, the contractor must comply with all provisions and procedures prescribed for the control and safety of construction team personnel and visitors to the job site. Compliance with regulations would ensure that no health and safety impacts would result from the silo and building modification phase of the Proposed Action.

Transportation of ABV missile components would be accomplished by aircraft or over road by truck. Compliance with FAA, DOT, OSHA, and applicable U.S. Air Force safety regulations would be followed. These transportation procedures would minimize the potential for accidents, as well as provide the means of mitigating potential adverse effects should an accident occur. Therefore, no health and safety effects to the public or to the base are anticipated.

Launch preparation activities would consist of transportation and storage of the liquid propellant, rocket components and support equipment to Vandenberg AFB and propellant transfer. The transportation and storage of liquid propellants, if required would be conducted in accordance with applicable state and federal requirements. Transportation of liquid propellants would occur entirely by road or by road and rail. Liquid propellants and explosives would be packaged in shipping containers designed according to DOT requirements to protect against release in the event of an accident. All containers would have proper placards and only commercial carriers licensed to handle/transport hazardous materials would be utilized.

There is the potential of ignition in an accident because the liquid propellants and explosives are sensitive to heat. The DoD has considerable experience with shipment of rockets and sensitive rocket components, including liquid propellants and explosives.

Liquid propellant storage areas would be fenced and appropriate placards would be used. Access would be limited to mission critical personnel. All personnel associated with the Proposed Action, including material storage, would be properly trained in compliance with 29 CFR 1910 procedures and other applicable state and federal regulations and guidelines. Personal protective equipment would be available and safety zones would be established. Although there is the potential of spill or release from damaged or leaking containers in storage areas, minimal health and safety impacts would be expected due to storage and containment protocol and worker training. A Spill Contingency Plan would enable rapid response to any leak and minimize the threat such a leak would pose to personnel and to the environment.

Launch Activities

Compliance with launch safety regulations would be provided through 30 SW/CCC, 30 SW/SE, and Mission Flight Space Control Officer. A written procedure for all explosive pre-launch activities is required and must be approved by 30 SW/SE.

An ESQD would be established around the launch site because of the potential for missile malfunction during a launch. Established procedures to prohibit access to restricted areas would be followed. The restricted areas are based upon the probability of potential hazards involved with malfunction during test flights and would include:

- The impact limit line, sets the boundary of the protection line for all non-mission-essential personnel
- The launch caution corridor, an area limited to essential personnel
- The LHA, an area around the launch point limited to essential personnel in hardened facilities (approximately 20 essential personnel in the LCC)
- The stage impact area

For impact limit lines that extend out of Vandenberg AFB boundaries, an agreement would be made with the appropriate landowners to control the use of these areas during launches. 30 SW/SE and the 30th Range Squadron Airspace and Offshore Management Section would oversee evacuations of surrounding land and water users.

An emergency response team, consisting of fire fighting, safety, medical, and bio-environmental engineering personnel, would be near the proposed project site during launch activities. Additional Vandenberg AFB personnel and resources would be called out if needed. Emergency response would also be provided through local county entities.

The range of acceptable launch azimuths for a Minuteman II from LF-23 was between 260 degrees and 280 degrees. The final range of approved azimuths for the ABV would be determined after submittal of the preliminary flight data package, which defines the

proposed launch azimuth and all launch vehicle performance characteristics for the proposed launch vehicle configuration. The azimuth would be limited to ensure that potential missile failure would not result in debris outside the azimuthal boundary. Final launch azimuth boundaries would be established after all vehicle performance data and areas of endangerment are reviewed, and FTS requirements are established.

The ABV test launches would take place in either existing restricted areas or warning area airspace that would be cleared of non-participating aircraft. The launches would be short-term events, after which joint-use airspace would be released to other users; advance scheduling would obviate impacts. The Flight Safety Analyst from 30 SW/SE would define which airspace areas would potentially be affected by the Proposed Action and the Chief, Airspace and Offshore Management Section would coordinate with the FAA and the U.S. Coast Guard to identify and address any issues of concern. No additional impacts would occur to airspace as a result of the Proposed Action.

With the implementation of the appropriate safety regulations and approvals and coordination with 30 SW/SE, the Proposed Action would not be expected to present a substantial impact to health and safety of base workers and personnel or the public.

Post-Launch Activities

Minor facility maintenance would occur after each ABV launch to ensure that the launch site would be operational for the next ABV test. Post-launch procedures would include silo inspection, removal of blast residue, and minor silo refurbishing.

Blast residue (propellant byproducts, burnt paint, and umbilical remnants) generated from the launch would remain within the launch silo. Entry to the silo would be restricted to trained and approved personnel in personal protective equipment as required by Vandenberg AFB Safety Office. The blast residue would be collected, removed, and properly disposed of in accordance with 40 CFR, California Code of Regulations Title 22, and the Vandenberg AFB Hazardous Waste Management Plan. Should the residue be identified as hazardous, there would be no impact to the health and safety of base personnel or the public.

Cumulative Impacts

Adherence to the safety systems on Vandenberg AFB would preclude any impacts to worker or public health and the environment as a result of the Proposed Action. The Proposed Action when added to the approximately 20 missile launches estimated for fiscal year 2002 is not expected to result in cumulative health and safety impacts.

4.1.7 INFRASTRUCTURE

Impacts to transportation could occur as a result of deterioration of the roadway system, a significant increase in traffic, or a disruption in Vandenberg AFB flightline operations. Thresholds of impact levels for traffic and circulation analyses for NEPA environmental reports have not been standardized. Santa Barbara County has officially adopted an

environmental thresholds and guidelines manual, which includes thresholds for transportation resources. These threshold criteria are intended to provide a basis for improved analysis of the potential traffic impacts of proposed projects and are used as guidelines for impact analysis.

A project may have substantial effects on infrastructure if it increases demand in excess of utility system capacity to the point that substantial expansion would be necessary. Environmental impacts could also result from system deterioration due to improper maintenance or extension of service beyond its useful life.

Pre-Launch Activities

Transportation

Installation of approximately 1.2 kilometers (0.75 mile) of underground fiber-optic cable would be required to connect LF-23 to Building 1959, the communications facility. The fiber-optic cable would be installed in existing conduit from Building 1959 along Globe Road, then up to Soldado Road until its intersection with Sercho Road, as shown in figure 2-4. From there, conduit and fiber-optic cable be installed from the existing conduit on the east side of Soldado Road, across Soldado Road, then for a very short distance on Sercho Road leading to the launch facility. Minor excavation (shallow trench) in the road shoulder along Sercho Road would be required for installing fiber-optic cable near LF-23. The affected areas would be repaired, as required, following installation of the conduit. Building 1978 is a previous Minuteman alert facility and may require minor internal modifications. Approximately 15 workers would be required for the silo modification phase of the Proposed Action.

Impacts to transportation from the approximate 15 transient contractor and program personnel during silo modification and the nominal 20 personnel required for routine missile transfer and launch preparation activities would be minimal. Few additional vehicles would be on the roadways during silo modification and routine launch preparation activities. A limited increase in traffic volume may occur, particularly along Sercho and Globe Roads, but would be temporary. The presence of equipment and personnel may result in a temporary disruption in traffic patterns in the immediate vicinity of the work sites. Routine ABV missile placement and launch preparation would require approximately 6 to 8 weeks. Therefore, any potential effect on base roadways and parking would be short-term. Launch preparation activities would have no long-term adverse impact on transportation on Vandenberg AFB and would have no impact to off base transportation.

Transportation of the ABV missile components would be accomplished by aircraft or over road by truck. These modes of missile transport are routine at Vandenberg AFB, and there would be no impacts to the ongoing base operations. Transportation procedures would comply with FAA, DOT, OSHA and applicable U.S. Air Force safety regulations. These procedures would minimize the potential for accidents, as well as provide the means of mitigating potential adverse effects should an accident occur. Up to six ABV tests over a 5-year period would be expected. These limited events would not have any substantial impact on existing transportation patterns or volume on or off base. Rail and marine traffic would not be affected by launch preparation activities.

A U.S. Air Force Form 103 (Work Clearance Request) would be submitted for the project site prior to any silo modification or road excavation. This permit requires the notification and approval of the Utilities Shop, the Communication Squadron, and the Explosive Ordnance Disposal Flight to avoid impacting existing utilities, telephone cables, and fiber-optic lines, or unexpected encounters with Explosive Ordnance Disposal. Upon notification, these divisions would flag the location of the lines at the project site. The Electrical Division would be consulted for the identification and location flagging of underground electric lines on site.

Utilities

Water. No additional water lines would be installed as a result of launch preparation activities. Any potential water use resulting from the nominal increase in personnel and launch preparation activities would be minimal and would not substantially increase demand on available base water supply.

Solid Waste. The potential increase in solid waste generated from the nominal increase in personnel and launch preparation activities would be minimal and would not substantially increase demand on the capacity of the Vandenberg AFB landfill.

Electricity. Overhead power would be supplied from the Vandenberg AFB main substation to LF-23. A permitted diesel generator would be used as a backup power source so secondary distribution lines would not be required. Area lighting, telephone communications, warning lights, and a public address system would also be installed at the site.

No adverse impacts to the affected environment are expected and any potential disruption to existing base electricity or communication would be short-term. The electrical requirements for the Proposed Action are within base capacity.

Launch Activities

Transportation

Before each launch, the ABV missile would be transported from Building 1555 or 1819 to LF-23. Transportation of the ABV missile components would constitute trips on area roads, which would be a minimal and temporary impact to traffic.

An ESQD would be established around the launch site because of the potential for missile malfunction during a launch. Restricted access to the launch area would result in a minimal and temporary impact to traffic. Approximately 20 essential personnel would be in the LCC. For impact limit lines that extend out of Vandenberg AFB boundaries, an agreement would be made with the appropriate landowners to control the use of these areas during launches. 30 SW/SE and the 30th Range Squadron Airspace and Offshore Management Section would oversee evacuations of surrounding land and water users.

The ABV test launches would take place in either existing restricted airspace or warning area airspace that would be cleared of non-participating aircraft. The launches would be

short-term events, after which joint-use airspace would be released to other users. Advance scheduling would obviate impacts. There would be no change in airspace designation; therefore, no land use compatibility conflicts would occur. The Flight Safety Analyst from 30 SW/SE would define which airspace areas would potentially be affected by the Proposed Action, and the Chief, Airspace and Offshore Management Section would coordinate with the FAA to identify and address any issues of concern. Similarly, marine vessels would be notified in advance of launch activities through a Notice to Mariners by the U.S. Coast Guard 11th District. Therefore, no impacts to airspace or marine traffic would occur as a result of the Proposed Action.

Passenger and freight trains frequently travel through Vandenberg AFB. Vandenberg AFB maintains strict policy not to launch over trains due to potential risk to people and property, which is implemented by close communication between the base and train engineers (U.S. Department of the Air Force, 1998).

Utilities

Water. Any potential water use resulting from launch activities and the presence of approximately 20 personnel would be minimal and would not substantially increase demand on available base water supply.

Wastewater. The potential increase in wastewater generated from launch activities and the presence of approximately 20 personnel would be minimal and would not substantially increase demand on Lompoc Regional Waste Water Treatment Plant.

Solid Waste. The potential increase in solid waste generated from launch activities and the presence of 20 personnel would be minimal and would not substantially increase demand on the capacity of the Vandenberg AFB landfill.

Electricity. The potential impact to current base power supply and communications resulting from ABV missile launch would be minimal.

Post-Launch Activities

Transportation

Minor facility maintenance would occur after each ABV launch to ensure that the launch site would be operational for the next ABV test. Post-launch procedures would include silo inspection, removal of blast residue, and minor silo refurbishing. Approximately four to eight personnel would be required for post-launch activities. Three to four personnel would remain at Vandenberg AFB between ABV launches. This minor increase in personnel and vehicles would not impact transportation on or off base.

Utilities

Water. Any potential water use resulting from post-launch activities and the presence of four to eight personnel would be minimal and would not substantially increase demand on available base water supply.

Wastewater. The potential increase in wastewater generated from post-launch activities and the presence of approximately four to eight personnel would be minimal and would not substantially increase demand on Lompoc Regional Waste Water Treatment Plant.

Solid Waste. The potential increase in solid waste generated from post-launch activities and the presence of approximately four to eight personnel would be minimal and would not substantially increase demand on the capacity of the Vandenberg AFB landfill.

Electricity. There would be no expected increase in demand to current base power supply and communications resulting from post-launch activities.

Cumulative Impacts

No other projects, programs, or activities have been identified that, together with the Proposed Action, would have the potential for cumulative impacts on infrastructure and transportation in the ROI.

4.1.8 LAND USE

This section addresses the potential impacts to land use due to site preparation and launches of ABV verification test.

Pre-Launch Activities

Site preparation of existing Vandenberg AFB facilities for ABV verification testing would not alter the overall land use and management of the base. Similarly, since ABV tests would use existing facilities on a military installation already utilized for launching missiles, no adverse direct or indirect visual impacts would occur.

Launch Activities

All federal development projects in a coastal zone and all federal activities which could directly affect a coastal zone must be consistent to the maximum extent practicable with the Coastal Zone Management (CZM) Program as authorized by the Coastal Zone Management Act of 1972. The CZM Programs are administered at the federal level by the Coastal Programs Division within the National Oceanic and Atmospheric Administration Administration's Office of Ocean and Coastal Resource Management. In compliance with federal Consistency Regulations (15 CFR Part 930) and the California CZM Program and Plan, the ABV program submitted a request for a Negative Determination to the California Coastal Commission stating the reasons that a consistency determination is not required for ABV launch activities. The California Coastal Commission has concurred with a Negative Determination for coastal zone impacts.

Although no adverse impacts to on-base land use are anticipated and no mitigation measures are required for the base, there is a potential for adverse impacts on coastal access, recreation, and commercial and sport fishing industries. These potentially adverse impacts can be minimized considerably by following applicable current Vandenberg AFB

policies and procedures relating to restricting launches to weekdays only, with night launches and weekends as a possible alternative.

Similarly, potential adverse impacts on the commercial and sport fishing industry can be minimized by ensuring that the same advance notice given to private land owners and affected Government agencies in on-land LHAs (U.S. Army Space and Strategic Defense Command, 1994) would be given to offshore users, particularly commercial fishing organizations and associations.

With sufficient advance notice of activation of offshore LHAs, fishing boats can schedule their trips to avoid the area. Also, efficient and timely coordination between the ABV program, the U.S. Air Force, and personnel on the patrol boats and helicopters responsible for clearance of offshore LHAs is critical. Minimizing launches during the prime commercial fishing season, from October through January, and avoiding launches on the weekends during the summer months (for benefit of the sportfishing industry) would also mitigate impacts.

Post-Launch Activities

Post-launch activities would include removal of blast residue from the silo and minor facility maintenance. These activities are not anticipated to result in land use impacts.

Cumulative Impacts

Since the proposed activities would be using existing facilities and all missile launches must be scheduled and approved by 30 SW/SE, the possibility of adverse, incremental cumulative land use impacts on Vandenberg AFB is avoided. However, the potential does exist for cumulative, incremental impacts on coastal access and recreational use of one of the two county parks or Point Sal State Beach and/or the additional public access beaches and coastline on Vandenberg AFB and to offshore water (land) uses, particularly commercial fishing. However, launches would be performed under the existing agreements between Vandenberg AFB and park/beach authorities.

4.1.9 NOISE

Noise impact criteria are based partly on land use compatibility guidelines and partly on factors relating to the duration and magnitude of noise level changes. Noise impacts include those that substantially increased the ambient noise levels for areas with noise sensitive uses. There are two areas of concern for the Proposed Action: noise effects on the local populace and launch personnel.

Pre-Launch Activities

Noise from launch preparation, including silo and building modifications, would comply with the Occupational Safety and Health Act, the U.S. Air Force Occupational Safety and Health regulations, the U.S. Army Corps of Engineers Safety and Health Requirements Manual (EM 385-1-1), Range Safety Requirements, and other recognized standards for operations that involve construction or facility modifications. Restricted public access to the proposed

project site would be ensured through use of signs and fencing. A health and safety plan, requiring the use of hearing protection when appropriate would be prepared by the contractor and submitted to the base to ensure the health and safety of onsite workers.

Launch Activities

The only noise associated with the ABV activities is airborne sound (not underwater). All dBAs are referenced to 20 micropascals. To evaluate the potential noise impacts associated with ABV test launch and ascent, it is necessary to consider not only the overall sound level but also the frequency spectrum and the duration of the exposure. High noise levels can cause annoyance and hearing damage. OSHA has established noise limits to protect workers at their work places. According to these standards, no worker can be exposed to noise levels higher than 115 dBA. The exposure level of 115 dBA is limited to 15 minutes or less during an 8-hour work shift (U.S. Air Force 1992). The OSHA standards are the maximum allowable noise levels for the personnel in the vicinity of the launch pad.

Missile and certain types of rocket launches produce the highest levels of noise on north Vandenberg AFB. This can range from 60 to 100 dBA in the vicinity of the launch including areas near Lompoc and Santa Maria. The noise from a Minuteman launch is 80 dBA approximately 13 kilometers (8 miles) from the launch site. Lompoc is 11 kilometers (7 miles) southeast of the proposed launch site and thus would experience noise levels slightly higher than 80 dBA. Santa Maria is 27 kilometers (17 miles) to the northeast. However, because the launches occur infrequently, the resulting noise has little impact on the L_{dn} or CNEL in these areas. Therefore, ambient noise levels would not be affected substantially on an annual basis from the proposed ABV tests. The ABV flight test launch noise would likely fall within or below the noise level measurements of previously approved Minuteman launch vehicles. Noise impacts would also be short in duration.

The maximum noise levels for the ABV flight tests during a launch have not been measured, but would be less than the noise from the larger Minuteman missile which is approximately 125 dB at 1.8 miles from the launch site. To mitigate direct impacts to personnel working at the LCC (Building 1978) or within the vicinity of the launch site, the following measures would be instituted:

- All non-essential personnel will be excluded from the launch area.
- Personnel who must work close to the launch site will be required to wear hearing protection that would reduce the noise levels to prescribed health and safety levels.

Since the flight pattern of the ABV test missile would be over the open ocean to the west, the flight would not cross populated areas such as nearby Lompoc or Santa Maria. Therefore, impacts from noise to populated areas would be minor. Noise impacts from prior Vandenberg AFB missile launches have been determined to be short term and therefore insignificant. Based on these results and compliance with regulations, the proposed launches would not cause or contribute to noise impacts.

Post-Launch Activities

No substantial noise would be expected from post-launch activities. However, any noise would likely fall within or below the noise level measurements of post-launch noise associated with the previously approved Minuteman launch vehicles. Noise impacts would also be short of duration. Post-launch activities would not cause or contribute to noise impacts.

Cumulative Impacts

The Proposed Action when combined with the approximately 20 launches planned for fiscal year 2002 (News-Press, 2002) is not expected to result in cumulative noise impacts.

4.1.10 WATER RESOURCES

Pre-Launch Activities

The launch site (LF-23) is not within any floodplain or tidal flood hazard area. Since site preparation only requires minor modifications to an existing launch facility and new excavation to install an underground fiber-optic cable beneath existing access road surfaces no withdrawal, or discharge to groundwater will occur. Launch preparation activities would follow spill prevention, containment, and control measures and thus minimize any potential impacts to surface water.

Launch Activities

Blast residue released during launch activities would be contained within the launch silo. Nominal launches in dry weather could deposit very small amounts of aluminum oxide. Most of the aluminum oxide would be suspended in the air and dispersed over very large areas. The EPA has determined that nonfibrous aluminum oxide as found in solid rocket motor exhaust is nontoxic. Rain within 2 hours of a launch could cause hydrogen chloride to be deposited in small quantities. The hydrogen chloride, under the most conservative rain conditions, would be diluted by the water and would not appreciably change the pH of the water. Modeling results for much larger solid rocket motors concluded that there would be insignificant impacts to surface water from aluminum oxide and hydrogen chloride. Launches scheduled during periods of precipitation would be canceled or postponed to eliminate the probability of contaminating storm water runoff and nearby water resources. (U.S. Department of the Air Force, 1997)

Post-Launch Activities

As discussed in section 2.1.5, blast residue (propellant byproducts, burnt paint, and umbilical remnants) released during launch activities would be properly scraped/swept up, collected, and placed in appropriate containers for disposal after the launch in accordance with U.S. Air Force, federal, state, and local regulations. Post-launch activities would follow spill prevention, containment, and control measures and thus minimize any potential impacts to surface water.

Cumulative Impacts

The proposed site preparation and launch activities when combined with the approximately 20 launches planned for fiscal year 2002 (News-Press, 2002) at Vandenberg AFB would not have any adverse effects on water resources. No other future programs have been identified that when combined with the Proposed Action would contribute to cumulative water resources impacts. All construction and actions would be completed in accordance with state and federal water resource regulations.

4.2 CUMULATIVE IMPACTS

Approximately 20 missile launches are estimated for fiscal year 2002 based on ballistic missile test requirements. No exceedance of air quality standards or health-based standards of non-criteria pollutants is anticipated. Missile launches are short-term, discrete events, thus allowing time between launches for emission products to be dispersed. The emissions from the Proposed Action when added to existing and proposed actions on Vandenberg AFB and within the South Central Coast Air Basin would not result in a cumulative impact to the region's air quality.

The potential cumulative impacts to biological resources from activities associated with site preparation and the ABV launches would not be substantial. No cumulative impacts to biological resources are expected as a result of fuel and oxidizer transport or filling operations. The amount of gaseous materials dispersed during launch is not expected to result in an increased potential for cumulative impact to marine species when combined with current and future launches.

Launching up to six ABV test flights over a 5-year period from LF-23 when combined with current missions on Vandenberg AFB is not anticipated to result in cumulative impacts to cultural resources.

Preparation of the launch site and other areas for the proposed activities would not result in cumulative impacts to geology and soils. The addition of up to six launches over a 5-year period, when added to the missile launches per year typical at Vandenberg AFB, would not result in a substantial cumulative impact to soils.

Adherence to the hazardous materials and waste management systems on Vandenberg AFB would preclude the potential accumulation of hazardous materials or waste. The Proposed Action is not expected to result in cumulative hazardous materials and hazardous waste impacts.

Adherence to the safety systems on Vandenberg AFB would preclude any impacts to worker or public health and the environment as a result of the Proposed Action. The Proposed Action when added to the missile launches per year typical at Vandenberg AFB is not expected to result in cumulative health and safety impacts.

Since the proposed activities would be using existing facilities and all missile launches must be scheduled and approved by 30 SW/SE, the possibility of adverse, incremental cumulative land use impacts on Vandenberg AFB are avoided. The Proposed Action when combined with the missile launches per year typical at Vandenberg AFB is not expected to result in cumulative noise impacts.

The proposed site preparation and launch activities, when combined with the missile launches per year typical at Vandenberg AFB, would not have any adverse effects on water resources. No other future programs have been identified that when combined with the Proposed Action would contribute to cumulative water resources impacts.

4.3 ENVIRONMENTAL EFFECTS OF THE NO-ACTION ALTERNATIVE

If the No-action Alternative is selected, no environmental consequences associated with the ABV program are anticipated. Vandenberg AFB would continue to launch missiles as analyzed in prior EAs such as the Theater Ballistic Missile Targets Programmatic EA (U.S. Department of the Air Force, 1997), the Booster Verification Tests EA, Vandenberg AFB (U.S. Department of the Air Force, 1999), and the EA for Air Force Small Launch Vehicle (U.S. Department of the Air Force, 1991).

4.4 ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

Adverse environmental effects that cannot be avoided include the release of small amounts of pollutants into the atmosphere and ocean, minor increased generation of hazardous materials at program-related sites, and impacts to wildlife from site preparation and launch noise and the increased presence of personnel. Any hazardous waste generated would be managed in compliance with RCRA, DoD, and other applicable federal, state, and local regulations.

4.5 CONFLICTS WITH FEDERAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS FOR THE AREA CONCERNED

All of the proposed program activities would take place in existing facilities and locations. These activities would not alter the uses of the sites, which were in the past or currently are used to support missile and rocket testing. There are no known conflicts with land use plans, policies, and controls at Vandenberg AFB.

4.6 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

Anticipated energy requirements of the ABV program would be well within the energy supply capacity of all facilities.

4.7 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENT OF RESOURCES

The Proposed Action would result in no loss of or impact on threatened or endangered species, and no planned impact to cultural resources, such as archaeological or historic sites. Moreover, there would be no changes in land use or preclusion of development of underground mineral resources that were not already constrained.

The amount of materials required for any program-related activities and energy used during the project would be small. Although the proposed activities would result in some irreversible or irretrievable commitment of resources such as various metallic materials, minerals, and labor, this commitment of resources is not substantially different from that necessary for many other defense research and development programs carried out over the past several years. Proposed activities would not commit natural resources in significant quantities.

4.8 RELATIONSHIP BETWEEN SHORT-TERM USE OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Proposed ABV program activities would take advantage of existing facilities and infrastructure to the extent practicable. The uses of the sites, which were or are to support missile and rocket launches, would not be altered. Therefore, the Proposed Action does not eliminate any options for future use of the environment for the locations under consideration.

4.9 NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL

Other than various structural materials and fuels, the ABV program would require no significant natural or depletable resources.

4.10 FEDERAL ACTIONS TO ADDRESS ENVIRONMENTAL JUSTICE IN MINORITY POPULATIONS AND LOW-INCOME POPULATIONS (EXECUTIVE ORDER 12898)

Proposed activities would be conducted in a manner that would not substantially affect human health and the environment. The EA has identified no effects that would result in disproportionately high or adverse effect on minority or low-income populations in the area. The activities would also be conducted in a manner that would not exclude persons from participating in, deny persons the benefits of, or subject persons to discrimination because of their race, color, national origin, or socioeconomic status.

4.11 FEDERAL ACTIONS TO ADDRESS PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS (EXECUTIVE ORDER 13045)

This EA has not identified any environmental health and safety risks that may disproportionately affect children, in compliance with Executive Order 13045.

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5.0 REFERENCES

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6.0

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7.0

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Missile Defense Agency (MDA)
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National Marine Fisheries Service, Long Beach, California

U.S. Fish and Wildlife Service, Ventura, California

Vandenberg Air Force Base
30 CES/CEV

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APPENDIX A

DISTRIBUTION LIST

APPENDIX A

DISTRIBUTION LIST

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Office of Historic Preservation
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California Regional Water Quality
Control Board
Central Coast Region
San Luis Obispo CA

Defense Technical Information Center
Fort Belvoir VA

GMS-E (Mr. Eric Sorrells)

Director, Missile Defense Agency
TERC, GC, EA

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National Marine Fisheries Service
Director, Southwest Region
Long Beach CA

Santa Barbara County
Air Pollution Control District
Attn: Project Review
Goleta CA

Santa Barbara County Fire Department
Protection Services Division

Hazardous Materials Unit
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APPENDIX B

CORRESPONDENCE



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

JUN 19 2002

F/SWR031:CCF
151404SWR02PR6432

Colonel Steve Davis
Director, Site Activation
Department of Defense, Missile Defense Agency
Ground-Based Midcourse Defense
Joint Program Office
P.O. Box 1500
Huntsville, Alabama 35807-3801

Dear Colonel Davis:

This letter responds to your May 23, 2002, request for the National Marine Fisheries Service (NMFS) to review a coordinating draft Environmental Assessment (DEA) for a proposed project involving the launching of up to eight alternate boost vehicles (ABVs) over a 5-year period, beginning as early as the Spring of 2003. The ABV tests would be conducted from a modified Minuteman II silo at Launch Facility-23 on north Vandenberg Air Force Base (VAFB), California. The three-stage ABV missile is a variation of the Minuteman and has not been previously flight-tested in the proposed configuration. For the proposed flight tests, the ABV would travel westward over the Pacific Ocean, approximately 6,500 kilometers (4,040 miles), to a proposed termination point north of the U.S. Army Kwajalein Atoll. No intercepts of target missiles are planned as part of the ABV tests. The DEA analyzes the potential environmental impacts of all proposed pre-launch, launch, and post-launch activities.

Specific comments to the DEA are provided as an attachment to this letter (Attachment 1). In summary, the DEA lacks the most up-to-date information on the expected number and identification of marine mammal species that may be present in the affected area of the launch (i.e. north VAFB). In addition, the analysis of potential impacts of launch activities on marine mammals is insufficient.

Based on past monitoring of similar activities on VAFB, the launch activity portion of this proposed project may have the potential to harass marine mammals protected under the Marine Mammal Protection Act (MMPA). According to the DEA, noise from Minuteman launches ranges from 125 dB re 20 μ Pa approximately 3 kilometers (2 miles) from the launch site to 80 dB re 20 μ Pa approximately 13 kilometers (8 miles) from the launch site. Launch noise from the ABV is expected to be quieter, and noise monitoring would be performed for the first launch. Because there is a potential for pinnipeds, particularly the Pacific harbor seal (*Phoca vitulina*), to be hauled out in areas close to Launch Facility-23 (e.g. Point Sal and Lion's Head), they could be



disturbed as a result of exposure to launch noise from the ABV. Startle reactions by pinnipeds, which have included "flushing" (i.e. fleeing into the ocean), have been observed during past missile launches on VAFB. Such disturbances could constitute a "take," as defined under the MMPA.

Under the MMPA, it is illegal to "take" a marine mammal without prior authorization from NMFS. "Take" is defined as harassing, hunting, capturing, or killing, or attempting to harass, hunt, capture, or kill any marine mammal. "Harassment" is defined as any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal in the wild, or has the potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

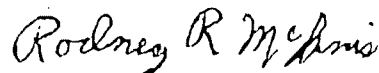
On March 1, 1999, NMFS published regulations authorizing the unintentional take of a small number of marine mammals incidental to missile and rocket launches and associated Air Force operations, effective until December 31, 2003 (Federal Register, Vol. 64, No. 39, 9925-32). Under the most recent Letter of Authorization (LOA), dated May 31, 2002, the Air Force is authorized to take Pacific harbor seals, California sea lions (*Zalophus californianus*), northern elephant seals (*Mirounga angustirostris*), and northern fur seals (*Callorhinus ursinus*) incidental to the launching of up to 10 Minuteman and Peacekeeper missiles from north VAFB and no more than 20 rockets from VAFB. This authorization contains mitigation, monitoring, reporting, and research requirements and is effective for one year.

Should a more complete analysis of impacts indicate that launch activities associated with the proposed action may "take" marine mammals, I recommend either of the following two options, both of which will include mitigation, monitoring, and reporting requirements:

1. coordinate with the Air Force to modify their existing LOA to include the ABV on their list of missiles launched annually from north VAFB; or
2. apply for a separate incidental harassment authorization under Section 101(a)(5)(D) of the MMPA.

Thank you for allowing NMFS the opportunity to comment on the DEA. If you have any questions regarding these comments, please contact Ms. Christina Fahy at (562) 980-4023.

Sincerely,



Rodney R. McInnis
Acting Regional Administrator

cc: K. Hollingshead - F/PR
J. Johnston - VAFB



DEPARTMENT OF DEFENSE
MISSILE DEFENSE AGENCY
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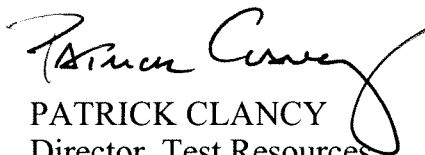
JUN 24 2002

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MEMORANDUM FOR U.S. ARMY SPACE AND MISSILE DEFENSE COMMAND
(SMDC-EN-V)

SUBJECT: Alternate Boost Vehicle (ABV) Verification Tests Coordinating Draft
Environmental Assessment, dated 20 May 2002

We have reviewed the subject document and are attaching the Missile Defense Agency's comments. Request our comments be addressed in the preparation of the final environmental assessment and resultant finding. Please contact Mr. Crate J. Spears at (703) 697-4123 (email: crate.spears@mda.osd.mil) or Mr. Edward Dieser at (703) 697-4342 (email: edward.dieser-contractor@mda.osd.mil) if you have any questions.


PATRICK CLANCY
Director, Test Resources

Attachment:
Comment Incorporation Summary

CALIFORNIA COASTAL COMMISSION

45 FREMONT STREET, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200



July 31, 2002

Department of the Air Force
30th Space Wing (AFSPC)
30 CES/SEV
806 13th Street, Suite 116
Vandenberg Air Force Base, CA 93437-5242

Attn: Jim Johnston

Re: **ND-042-02** Negative Determination, for the booster tests of the National Missile
Defense Program, Vandenberg Air Force Base, Santa Barbara County

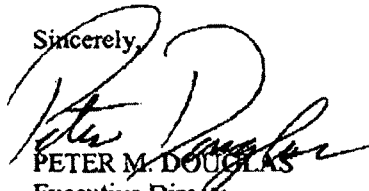
Dear Mr. Johnston:

The Coastal Commission staff has received the above referenced negative determination. The Air Force proposes to conduct four booster test flights for the Ballistic Missile Defense System at Vandenberg Air Force Base. The booster test flights will use an existing launch facility (LF-23) and will require the installation of 0.75 to 1.3 miles of underground fiber optic cable to connect the launch site to a communications facility. The Purpose of the booster test flights is to verify booster and silo designs and demonstrate booster vehicle maneuverability.

This project is similar to ND-016-99, which was recently approved by the commission, and CD 6-99, Theatre Defense Missile Project, and will be incorporated into the Theatre Defense Missile program. Therefore, the public access, marine mammal, air quality, and other resource impacts will be similar to the effects from the Theatre Defense Missile program.

The Commission staff agrees that the project is the same or similar to an activity previously approved by the commission. We therefore concur with your negative determination made pursuant to Section 15 CFR 930.35(d) of the NOAA implementing regulations. Please contact Kathleen Stycket of the Commission staff at (415) 904-5295 should you have any questions.

Sincerely,



PETER M. DOUGLAS
Executive Director

cc: South Central Coast Area Office
OCRM